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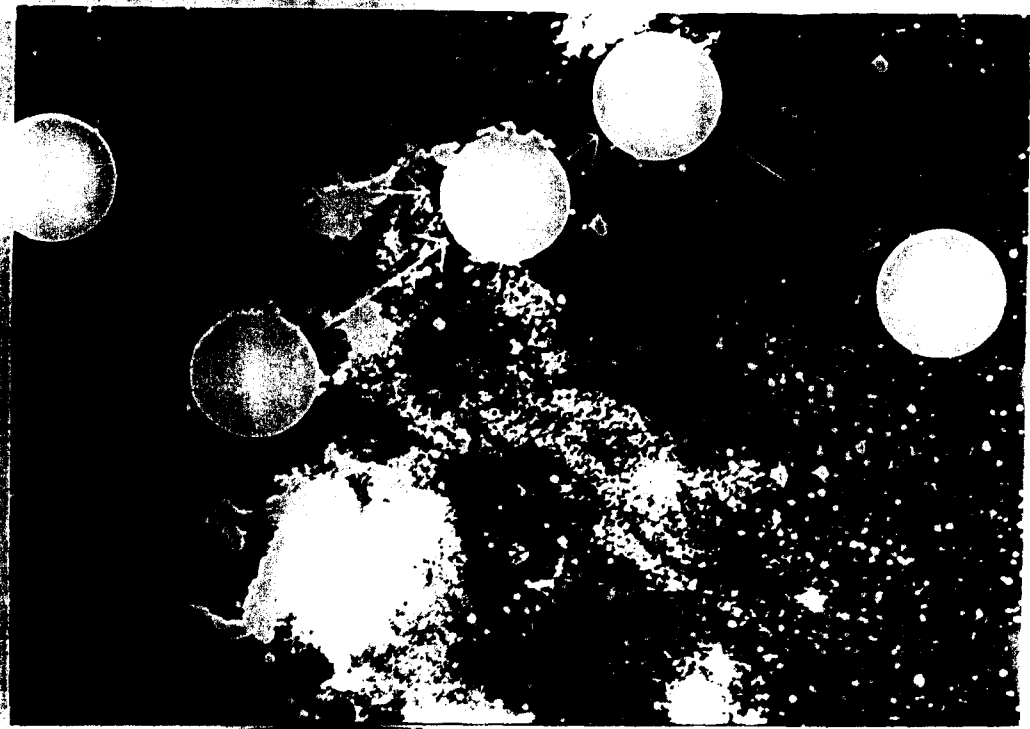
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PERT COST SYSTEM COMPUTER PROGRAM HANDBOOK

(PART II)

Programmer's Guide

ADVANCE COPY FOR AFSC IMPLEMENTATION



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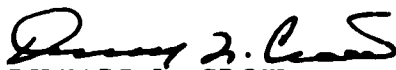
FOREWORD

This manual is Volume IV, Part II of the USAF PERT series. It serves as a companion publication to Volume II, USAF PERT Time System Computer Handbook, dated September 1963.

This document provides a programmer-oriented, complete with flow diagrams, of the IBM 7090 computer program developed to process data for the USAF PERT Cost System. The schedule information input to the program is externally generated from the USAF PERT Time program or any comparable computer program. The cost information input is obtained through the use of input forms or externally generated tapes.

This program produces all of the output reports described in the USAF PERT Cost System Description Manual, dated December 1963, and Supplement #1 of the DOD and NASA Guide to PERT Cost, dated March 1963.

Comments concerning any part of this publication are solicited from both government and industry sources, and should be forwarded to Hq AFSC (SCCSS), Andrews Air Force Base, Washington 25, D. C. 20331.


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Brigadier General, USAF
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USAF PERT

VOLUME IV

PERT COST SYSTEM COMPUTER PROGRAM HANDBOOK

(PART II)

Programmer's Guide

DECEMBER 1963

USAF has produced a series of PERT documents to provide understanding of the USAF PERT TIME and PERT COST Systems presently in use. This manual is the fifth volume in the USAF PERT series.

VOLUME I	USAF PERT TIME SYSTEM DESCRIPTION MANUAL
VOLUME II	USAF PERT TIME SYSTEM COMPUTER HANDBOOK
VOLUME III	USAF PERT COST SYSTEM DESCRIPTION MANUAL
VOLUME IV	USAF PERT COST SYSTEM COMPUTER PROGRAM HANDBOOK, PART I
	USAF PERT COST SYSTEM COMPUTER PROGRAM HANDBOOK, PART II
VOLUME V	USAF PERT IMPLEMENTATION MANUAL

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CHAPTER I

GENERAL SYSTEM DESCRIPTION

CHAPTER I

GENERAL SYSTEM DESCRIPTION

I-A CAPABILITIES

PERT Time Data

The system derives its schedule information from tapes generated by various PERT Time systems. This is accomplished through the use of the PERT Time Tape Description Input Forms.

Output Reports

The module produces all of the reports currently described in the USAF PERT Cost System Description Manual. The user may select the type and level of report to be generated with each computer run.

Error Editing

The module has an extensive error editing capability in each of its 4 phases.

Calendar Routine

The system uses a calendar routine which excludes all weekends and holidays from its computations.

Master File

Time and cost data are maintained in a master file which may be automatically updated.

Computer Run Options

There are 7 types of options which permit the user to start and stop the program at various points in the processing cycle. These options are discussed in Subsec. I-C.

Cost Data Only

The program processes cost data without using PERT Time information. This means that the PERT Cost reports will not contain the customary schedule information.

Capacity

The capacity of the program is generally stated as follows:

(a) Work Breakdown Structure

The program will process a work breakdown structure composed of 16 levels. The maximum amount of change or summary numbers that may be associated with a particular parent number is 63.

(b) PERT Network

The system is capable of processing data derived from multiple PERT networks. There is no limit as to the number of activities contained in these networks. However, all of the PERT time data must be contained on a single tape.

(c) Performing Organization / Resource Code Combinations

There is no limit as to the number of Performing Organization / Resource Code combinations that may be associated with a particular charge or summary number.

(d) Activities

There is no limit as to the number of activities that may be associated with a particular charge or summary number.

(e) Cost Data

The system will retain budgeted, estimated, and actual costs in the master file in monthly increments. The maximum number of monthly increments for a particular performing organization / resource code combination is 60.

(f) Rate Table

The maximum number of resource codes or combinations that may be entered in the rate table is 266. The maximum number of rates that may be distributed among these combinations is 1600.

(g) Rainbow Categories

The maximum number of rainbow categories that may be entered in the system is 20. The maximum number of resource codes that may be distributed among these 20 categories is 200. A resource code may not be associated with more than one rainbow category.

(h) Cost Categories

The maximum number of cost categories that may be entered in the system is 200. The maximum number of resource codes that may be distributed among these categories is 200. A resource code may not be associated with more than one cost category.

The flowchart illustrates the PERT Costing System, organized into four distinct phases separated by vertical dashed lines.

- PHASE I: DATA ENTRY**
 - INPUT, SORT AND SORT** (Central Processing Unit)
 - Inputs:**
 - CHANGE OF SUMMARY NUMBER IDENTIFICATION INPUT FORM
 - BUDGET AUTHORIZATION INPUT FORM
 - COST ESTIMATING INPUT FORM
 - DATE TABLE INPUT FORM
 - ACTUAL COST INPUT FORM
 - MONITOR SKILL RANKING CATEGORY
 - RESOURCE CODE COST CATEGORY INPUT FORM
 - CONTROL CARDS & PARAMETER CARDS
 - Outputs:**
 - PARAMETER AND TIME OF ACTIVITY TO CHANGE NO.
 - COST CHANGES
- PHASE II: ACTIVITY - CHANGE NO. MERGE**
 - ACTIVITY TO CHANGE NUMBER MERGE ROUTINE** (Central Processing Unit)
 - Inputs:**
 - LAST CYCLE: SECONDARY PERT MASTER
 - CURRENT CYCLE: SECONDARY PERT MASTER
 - USERS PERT TIME TABLE
 - INPUT TAP (Receives PARAMETER AND TIME OF ACTIVITY TO CHANGE NO.)
 - Outputs:**
 - EXCEPTION AND ERROR REPORTS
 - SWT TIME INFO TO CHANGE NUMBER SEQUENC.
- PHASE III: PERT COST UPDATE**
 - PERT COST MASTER UPDATE ROUTINE** (Central Processing Unit)
 - Inputs:**
 - LAST CYCLE: PERT COST MASTER
 - CURRENT CYCLE: PERT COST MASTER
 - TIME INFO IN CHANGE NUMBER SEQ.
 - INPUT TAP (Receives COST CHANGES)
 - Outputs:**
 - EXCEPTION AND ERROR REPORTS
 - SWT TIME INFO FOR OUTPUT
- PHASE IV: OUTPUT REPORTING**
 - DEVELOP OUTPUT REPORTS ROUTINE** (Central Processing Unit)
 - Input:** SORTED RAW DATA FOR REPORTS
 - Output:** REPORTS

Figure I-B-1 PERT Cost Module - Logic Flow

I-B PROGRAM LOGIC

The program is divided into four phases as shown in Fig. I-B-1. These phases are generalized as follows:

Phase I: Edit and Input Sort

In Phase I, the program reads in all of the input data. Each card is edited for errors. These errors are written on the output tape. An edited data tape is produced and subsequently sorted into card number sequence. The final product of Phase I is a sorted data tape.

Phase II: Activity to Charge Number Merge

In Phase II, the link between the PERT Time system and the PERT Cost module is formed. The PERT Cost Secondary Master File contains the network activities and their associated charge numbers. There is no time information such as T_E , T_L , slack, etc., in this file. This time information is provided by the users PERT Time tape.

In Phase II a sorted time tape and a new Secondary Master File are generated. This is accomplished in the following manner:

- (a) The program will read in the new PERT Time parameter cards from the sorted data tape. If there are no parameter cards, then this information is read in from the PERT Cost Secondary Master File.
- (b) The user's PERT Time tape is read into the system through the use of this parameter data. If the PERT Time tape is not in the proper sequence, then each record is written in a prescribed format on another tape. This tape is then sorted into the proper sequence.
- (c) The program then proceeds to merge these three tapes; that is, the sorted data tape, the user's PERT time tape, and the secondary master tape are matched one activity at a time.

- (d) The Type 2 cards (Activity/Charge Number card), if present on the sorted data tape, are used to update the Old PERT Cost Secondary Master File. As this master is being generated.
- (e) Wherever an activity on the secondary master matches an activity on the user's PERT Time tape, that activity with its associated charge number and time information are placed on an activity - time tape.
- (f) This process continues until all of the activities on the new secondary master have been matched with the user's PERT Time tape. This process results in the generation of an activity - time tape and a new secondary master tape.
- (g) The activity - time tape is then sorted into charge number sequence to be used in Phase III.

Errors encountered during the time merge phase are written on the System Error Tape or on the on-line printer. Messages on the System Error Tape will not stop the processing. However, at the conclusion of this phase, the errors will be totaled and printed on-line. The computer will halt, indicating an option to continue. Some errors will cause the computer to halt during the processing cycle. These errors are written on-line and must be rectified prior to rerun.

Phase III: PERT Cost Update

In Phase III the PERT Cost Master File is either established or updated from the data contained in the sorted activity - time tape and the sorted data tape. This phase also generates a sorted report tape which contains all of the data necessary for the final reporting phase. This is accomplished in the following manner:

- (a) A record is read into the system from each of the three tapes. More clearly, the information relating to one charge number is read in from each of the tapes, i. e., the PERT Cost Master, the sorted data tape, and the sorted activity - time tape.
- (b) The Old PERT Cost master is updated and a new PERT Cost master is generated. The sorted activity - time tape is interrogated to obtain all of the time information associated with each activity assigned to the current charge number.
- (c) This time and cost data are written on the report tape.
- (d) The report tape is then sorted, to be used in Phase IV.

The errors that are encountered during this phase are written on the System Error Tape or on the on-line printer. Messages on the System Error Tape will not stop the processing. However, at the conclusion of this phase the errors will be totaled and printed on-line. The computer will halt, indicating an option to continue. Some errors will cause the computer to halt during the processing cycle. These errors are written on-line and must be rectified prior to rerun.

Phase IV: Output Reporting

In Phase IV the output reports are generated and written on the output tape. Some errors will cause the computer to halt during the processing cycle. These errors are written on-line and must be rectified prior to rerun.

I-C Computer Run Options

The user is provided with seven options that permit the program to be started and stopped at various points in the processing cycle. The letter indicating the desired option is placed in column 2 of the main control card. These options are briefly described below.

Option A

The input data will be read into the computer and edited for errors. An edited tape will be produced. The errors found during this edit will be placed on the output tape.

Option B

The program will perform those functions described in Option A. In addition, it will sort the edited data into card and type code sequence, thus producing a sorted input tape.

If errors have been uncovered during the edit phase the computer will halt after the edited tape has been generated. The number of errors will be printed on-line. If the user does not deem the number to be excessive, the start key on the console is depressed and processing continues until the sorted input tape is produced. If no errors have been encountered, the program will automatically continue into the next phase.

Option C

The program will perform those functions described in Option B. In addition, it will update the activity-charge number data contained in the Secondary Master Tape; i. e., the first file of the PERT Cost Master Tape. This file is then merged with the user's PERT Time tape to produce a merged time tape. This tape contains each activity, its time

data, and its associated charge number. The merged time tape is then sorted into charge number sequence, producing the sorted time tape.

Errors encountered during the merge phase will be printed on the output tape. If errors have been encountered, the merged time tape will be written and the computer will halt. The number of errors will be printed on-line. If the user does not deem this number to be excessive, the start key on the console is depressed and processing continues until the Work Package/Activity Report is generated. If errors have not been encountered the system will continue processing until the Work Package/Activity Report is generated.

Option D

Option D is used to run from the start to the end of the entire program. The program will perform those functions described in Option C except that the Work Package/Activity Report is not automatically produced. It must be requested by the user through the use of the Report Selection Card.

In addition, the program will use the data contained on the sorted time tape to update the PERT Cost master tape. During this updating phase, the data necessary for the output reports are written on a tape. This tape is sorted to form the sorted output tape. Finally, the program generates all of the output reports requested by the user.

If errors in the data are encountered during this updating phase, they will be printed on the output tape. The computer will halt and the number of errors will be printed on-line. If the user does not deem this number to be excessive, the start key on the console is depressed and processing continues until all of the output reports are generated.

Option E

Option E is selected if the user has previously used Option B and now wishes to continue through Option C; that is, Option E is used if a

sorted input tape has been generated as a result of Option B and the user now wishes to continue processing to obtain the information that would have resulted from Option C (e. g. , error messages or the Work Package/Activity Report).

Option F

Option F is selected if the user has previously used Option B and now wishes to go through the entire system to obtain the output reports.

Option G

If the user has generated a sorted time tape as a result of using Options C or E and now wishes to continue through the system, Option G is used. This option is also used if the user wishes to produce the PERT Cost reports without using PERT Time data. Therefore, the reports generated will not contain the customary PERT Time information.

CHAPTER II

OPERATING PROCEDURES

CHAPTER II

OPERATING PROCEDURES

II-A IBSYS MONITOR

The USAF PERT Cost system uses the IBSYS Basic Monitor system. The official designation of this monitor is the IBM 7090/7040 IBSYS Processor 7090-PR-130, Version 8.

System Unit Function Table, SYSUNI

Systems operating under the IBSYS monitor must use certain tape units to carry out specific functions such as library, job input, and output. Tape units, therefore, are assigned certain symbolic names which are indicative of their functions. These symbolic names and their corresponding tape units are maintained by the monitor in a table designated as the System Unit Function Table, or SYSUNI. Since the assignment of tapes may vary with each computer installation, the monitor provides for the modification of this table through the use of the Unit Assignment Control Cards.

The IBSYS Master used by Aerospace Corporation uses the following SYSUNI table.

SYSLB1	A1	SYSPP1	A5
SYSOU1	A2	SYSUT2	B1
SYSIN1	A3	SYSUT3	B2
SYSUT1	A4	SYSUT4	B3

All other tape units are unassigned.

II-B TAPE ASSIGNMENT

The USAF PERT Cost program distributed by Aerospace Corporation uses the tape assignments shown in Fig. II-B-1.

Channel A							
1	2	3	4	5	6	7	8
IBSYS Master	Output List	PERT Cost PGM. input deck	Utility		Change tape and NEW P/C MASTER FILE	Utility	
SYSLB1	SYSOU1	SYSIN1	SYSUT1				

Channel B							
1	2	3	4	5	6	7	8
Utility	Utility		PERT Time Data	Utility (edited input)	OLD P/C MASTER FILE (only for updating)		
SYSUT2	SYSUT3						

Fig. II-B-1 Tape Assignments

II-C TAPE REASSIGNMENT

The tapes shown in Fig. II-B-1 may be reassigned to other units and channels through the use of either of the following two procedures:

- (a) The Tape Reassignment Card (Control Card D) described in Chapter III of the USAF PERT Cost System - Cost Module, Volume IV Part I) may be used.
- (b) A permanent change may be effected by recompiling the program, using the change cards shown in Fig. II-C-1. The asterisks shown in the variable field portion of these cards refer to the entries in Table II-C-1.

LOCATION	OPERATION	ADDRESS	TAS	DECREMENT	COUNT	COMMENTS	T2	T3	T4
TA1	PZE	*	*	*	*	INPUT - NEW MASTER			00245000
TA3	PZE	*	*	*	*	INPUT - SORT			00245100
TA4	PZE	*	*	*	*	SORT			00245200
TA5	PZE	*	*	*	*	OUTPUT (SYSOUT)			00245300
TB1	PZE	*	*	*	*	CHANGE			00245400
TB2	PZE	*	*	*	*	OLD MASTER			00245500
TB4	PZE	*	*	*	*	USER'S PERT TIME TAPE			00245600
TB5	PZE	*	*	*	*	SORT			00245700
TB6	PZE	*	*	*	*	SORT			00245800

Fig. II-C-1 Change Cards for Tape Reassignment

Important Points

It is important to observe that:

- (a) TA5 must correspond to the SYSOUT1 tape
- (b) TA3 and TA4 should be on opposite channels from TB5 and TB6 for efficiency in sorting.

Table II-C-1
Variable Field Entries for Assigning Tapes

<u>PHYSICAL UNIT</u>	<u>VARIABLE FIELD (COLS 16-21)</u>
A1	641, 1
A2	642, 1
A3	643, 1
A4	644, 1
A5	645, 1
A6	646, 1
A7	647, 1
A8	648, 1
B1	1153, 1
B2	1154, 1
B3	1155, 1
B4	1156, 1
B5	1157, 1
B6	1158, 1
B7	1159, 1
B8	1160, 1

Tape Assignments With ASD Basic Monitor

In the event that the USAF PERT Cost program is run in conjunction with the version of the IBSYS Basic Monitor used at the Aeronautical Systems Division (ASD), the user may consider it advantageous to permanently change the tape assignments in the PERT Cost program. In this case the following modifications are suggested.

- (a) Recompile the PERT Cost program using the change cards shown in Figure II-C-2.

LOCATION	OPERATION	ADDRESS TAG	DECREMENT	COUNT	COMMENTS	LABEL
TA1	PFE	647	1	A7	INPUT - NEW MASTER	00245000
TA3	PFE	646	1	A6	SORT	00245100
TA4	PFE	645	1	A5	SORT	00245200
TA5	PFE	1155	1	B3	OUTPUT	00245300
TA1	PFE	1154	1	B2	CHANGE	00245400
TA2	PFE	1156	1	B4	OLD MASTER	00245500
TA4	PFE	1153	1	B7	USER'S TAPE	00245600
TA5	PFE	1150	1	B6	SORT	00245700
TA6	PFE	1157	1	B5	SORT	00245800

Fig. II-C-2. Change Cards for Conversion
to the ASD Version of IBSYS

- (b) Modify the SYSUNI table through the use of the following cards:

Col 1	8	16	21
\$ RELEASE		SYSCK 1	
\$ RELEASE		SYSCK 2	
\$ RELEASE		SYSOU 2	
\$ RELEASE		SYSPP 2	

II-D IBSYS COMPILING PROCEDURES

Input Deck Set-up

The input deck consists of the following cards in the following sequence.

Card	Columns	1	7	8	16	73	80
(a)		\$IBSYS					
(b)		\$ATTACH			A7		
(c)		\$AS			SYSCKI		
(d)		\$REWIND			SYSCKI		
(e)		\$ATTACH			B7		
(f)		\$AS			SYSCK 2		
(g)		\$REWIND			SYSCK 2		
(h)		\$EXECUTE			FORTTRAN		
(i)		\$ID					
(j)		*		PACK			
(k)		*		FAP			
(l)				UPDATE 9, 10			
(m)				DELETE		00000010	
(n)				COUNT 30000		00000250	
(o)		(Correction cards)					

Correction cards are used to update the symbolic program cards.

Serialization must be entered in columns 73-80. See the FAP manual for the precise format of these cards.

End Card

An end card must be inserted with the following format:

Card	Column	8	73	80
(p)		END	99999999	

IBSYS Control Cards

Card Columns 1 16

(q) § IBSYS

(r) § REMOVE SYSCK 1

(s) § REMOVE SYSCK 2

(t) § STOP

Tape Assignments

The tape assignments for compilation are shown in Fig. II-D-1

Channel A							
1	2	3	4	5	6	7	8
IBSYS Master	Output list	Input deck	Utility	Punch		Old blocked update tape (symbolics)	
SYSLB 1	SYSOU 1	SYSIN 1	SYSUT 1	SYSPP 1		SYSCK 1	

Channel B							
1	2	3	4	5	6	7	8
Utility	Utility	Utility				New blocked update tape (symbolics)	
SYSUT 2	SYSUT 3	SYSUT 4				SYSCK 2	

Fig. II-D-1. Tape Assignments for Compilation

Peripheral Input

Place the card deck described on Page II-D-1 on tape, using an IBM 1401 card-to-tape program. Place this tape on unit A3 as indicated in Fig. II-D-1.

Console Operation

- (a) Reset.
- (b) Clear and load tape.

- (c) On-line printer message will indicate the number of errors.
- (d) Save B7 (new, updated symbolic tape).

Peripheral Output

- (a) Program listing is on A2 (SYSOU 1).
- (b) Absolute FAP deck is on punch tape A5 (SYSPP 1).

Compilation Using ASD IBSYS Monitor

The tape assignments for compiling the PERT Cost module using the ASD version of IBSYS are shown in Fig. II-D-2.

Channel A							
1	2	3	4	5	6	7	8
IBSYS Master SYSLB 1		Input deck SYSIN 1				Old blocked update tape (symbolics) SYSCK 1	
				SYSUT 1	SYSUT 3		

Channel B							
1	2	3	4	5	6	7	8
Punch Tape SYSPP 1		Output List SYSOU 1				New blocked update tape SYSCK 2	
				SYSUT 2	SYSUT 4		

Fig. II-D-2. Tape Assignments for Compilation Using the ASD Version of IBSYS

Peripheral Output

- (a) Program listing is on B3 (SYSOU 1).
- (b) Absolute FAP deck is on punch tape B1 (SYSPP 1).
- (c) Due to the size of the program the symbolic reference table will not be generated.

II-E IBSYS OPERATING PROCEDURES

Input Deck Set-up--Program

The PERT Cost program deck consists of the following cards in the following sequence.

IBSYS Control Cards

Card	Columns	1	7	8	16
(a)		\$IBSYS			
(b)		\$EXECUTE			
(c)		End-of-file card			
(d)		#ID			
(e)		# XEQ			

Program Cards

(a) First program section
(b) Card Columns 1 7
DATA
(c) Remaining program sections

IBSYS Control Cards

Card Columns 1

(a) \$IBSYS
(b) \$STOP

Input Deck Set-up--PERT Cost Data

The PERT Cost data cards must be assembled in the following sequence.

(a) UNSORTED RAW DATA TAPE (Columns 1-22)
(b) Control Card A #
(c) Control Card B #
(d) All other control cards if required *
(e) Cost Data (sort not required) *
(f) EOF Card

* See USAF PERT Cost Volume IV Part I for precise format.

Tape Assignments

The tape assignments required for operation of this program are shown in Fig. II-B-1.

Peripheral Input

- (a) Place deck described as "Program Deck" on tape. Place tape on A3.
- (b) Place deck described as "Cost Data " on tape. Place tape on A6.

Console Operation

- (a) Reset.
- (b) Clear and load tape.
- (c) Follow on-line printer instructions.

Program Halt

Should the program be aborted (due to machine malfunction, etc.) after operating the PERT Cost edit sort phase, logical tape unit B-5 must be switched with A6 in order to restart without having to rewrite the tape containing the PERT Cost data. An on-line message will indicate when this portion of the program has been operated.

II-F IBSYS CONVERSION MACROS

This PERT Cost program was initially programmed, compiled, and checked out using the Aerospace System B monitor. In order to distribute the program for use with the IBSYS monitor, a compatibility package was written. This package channels all of the I/O through IOEX (the trap supervisor employed by IBSYS) through the use of macro instructions. It is used to start and stop all I/O operations as well as to check for redundancies and initiate recovery procedures. This package was used to compile the PERT Cost program using IBSFAP by placing the card deck containing the macros in front of the PERT Cost program.

The following macros were used:

- (a) LODMIT - Brings successive program sections from SYSIN1 into core.
- (b) OUTPUT - Writes on-line and off-line messages
- (c) BACKR - Backspace a record (s)
- (d) BACKF - Backspace a file (s)
- (e) READ - Read a record
- (f) WRITE - Write a record
- (g) WEOF - Write an end-of-file mark
- (h) REWND - Rewind a tape
- (i) UNLOAD - Rewind and unload a tape
- (j) CARDS - Read a card image from SYSIN1
- (k) STEPR - Skip a record (s)
- (l) STEPF - Skip a file (s)
- (m) TAPESN - Returns the address of the unit control block for the tape unit indicated in the address of the accumulator

CHAPTER III

PROGRAM PHASE DESCRIPTION

CHAPTER III

PROGRAM PHASE DESCRIPTION

III-A OUTLINE OF PROGRAM PHASE DESCRIPTION

Section III of this Programmer's Manual will discuss the operations of the phases used in the PERT Cost Program and will indicate all messages forthcoming from these phases, as well as the tape configurations and actions. The topical subheadings are listed below with the corresponding page references.

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III-B

INPUT/OUTPUT

The input/output routines will handle the complete I/O operations that are used during the edit, edit sort, PERT Time merge, and updating phases of the system. The writing of the SYSTEM ERROR TAPE, OUTPUT REPORT TAPE, and the on-line messages will be done outside of this phase. All reading and writing done in these subroutines, outside of the tables, will be double-buffered.

READ Subroutines

The READ subroutines will accomplish the reading function for the following set of tapes:

(a) SORTED DATA TAPE (RCHG)

The edited data information, which is the first file on this tape, is bypassed to get to the point where the sorted data begins. Up to nine of these tapes can be read but they must be in proper sequence—i. e., the order of their creation. If more than one EDITED DATA TAPE is created, only the last one of this edited data series, which also contains the first portion of the SORTED DATA TAPE, need be set onto the tape unit. Each time this tape is read, the location of the record in the buffer is set into CHHLD. CHHLD is originally set to all ones, and at end-of-file (E. O. F.) it is set to all zeros.

(b) OLD PERT COST MASTER (ROPM)

Up to nine of these tapes can be read but they must be set up in their order of creation. The information read by this subroutine will be of a variable nature.

(c) OLD SECONDARY MASTER (ROSM)

Up to nine of these tapes can be read but they must be set up in their order of creation. The data on this tape is blocked but of a fixed length per block.

(d) INPUT DATA TAPE (RRWD)

Up to nine of these tapes can be read and they can be in any order desired, except that the tape containing the control cards must be set on first. After reading is completed the last two tapes are either rewound and unloaded or just rewound, dependent on the option selected.

(e) EDITED DATA TAPE (REDD)

Up to nine of these tapes can be read but they must be set up in their order of creation. After the reading of these tapes the last one is not rewound, since the SORTED DATA TAPE is set onto this tape as a second file.

(f) SORTED TIME TAPE (RSTT)

Up to nine of these tapes can be read in Option G, but they must be set up in order of creation. If Option C, D, E, or F is in effect, this read will be a pickup of the sort information from the activity to charge number sort. For Options C and E only, the pickup of information from the sort and the creation of this SORTED TIME TAPE are accomplished.

(g) USER'S TIME TAPE (PMRD)

This tape is read for Options C, D, E, and F during the Time Merge phase, and its control area will be located in PD70 of the PMRD routine.

All of the above subroutines will use the common read area (RCOM) where all the error messages and I/O macros are centered. Each of the above subroutines modifies certain locations in the RCOM area (as indicated on Page III-B-38). Operating all the reads through a standard routine gives a uniformity to all I/O messages set out in this system. Each of the above subroutines will have a block of data that sets up information for reading and label checking. This block of information is 31 words long and takes the following form:

(1) XXDTE - 1 Word

The date set on this tape is from the previous cycle. It is picked up from the "A" control card.

(2) XXTPE - 1 Word

This is the tape unit number. It indicates the tape unit on which this tape is to be found. This information is set in this location in RCOM after the tape selection routine.

- (3) R(X)60 - 3 Words
This location will be the link to the XXTPE information which is used in reading. If the operation code is PZE the tape is read in the binary mode. If the code is MZE the tape is read in the BCD mode. Following the R(X)60 location will be the read commands for picking up the label.
- (4) R(X)70 - 1 Word
This word is the exit that is used when E. O. F. is found.
- (5) R(X)62 - 2 Words
These words will contain the read communication information.
- (6) R(X)90 - 10 Words
The label read from the tape is set into this location.
- (7) R(X)93 - 6 Words
The XXDTE is placed into this line. This record is then compared to the label that was set into R(X)90. At each comparison the tape number is increased by one.
- (8) R(X)95 - 4 Words
This portion of a message is used for some of the messages set out during the I/O operation. The tape number is set into the last word of this message.
- (9) R(X)97 - 1 Word
This location will hold the actual tape number in the form of X0000N, where X is the channel and N is the unit number.
- (10) R(X)98 - 1 Word
In case of read error the reason for error is saved in this location.
- (11) R(X)99 - 1 Word
This location will indicate whether this is the first time through this particular read subroutine. A non-zero value indicates this is not the first time through.

In the above, the X's indicate that this block is repeated for each read subroutine and each block will have a different letter in place of the (X).

WRITE Subroutines

The WRITE subroutines will accomplish the writing function for the following set of tapes. All of these tapes are produced in the binary mode except where indicated.

(a) NEW PERT COST MASTER (WNPM)

Up to nine of these tapes can be written during a cyclic or file establishment run. The records on this tape will be of variable length.

(b) NEW SECONDARY MASTER (WNSM)

Up to nine of these tapes can be written during a cyclic or file establishment run. The record size is fixed but is set into blocks of 600 words.

(c) EDITED DATA TAPE (WRWD)

Up to nine of these tapes can be written during a cyclic or file establishment run. The records are written one at a time and are unblocked. This tape is developed in the BCD mode.

(d) SORTED TIME TAPE (WSTT)

This operation is accomplished for use in Option G, with up to nine of these tapes being created during Options C or E. The records on this tape are of fixed length, but are grouped in blocks of 576 words.

(e) SORTED DATA TAPE (WCHG)

This tape write will be the second file following the EDITED DATA TAPE. Up to nine of these tapes can be created during a cyclic or file establishment run. The records on this tape are grouped in blocks of 200 words and are written in the binary mode. The two files on this physical tape are written in different write modes, that is the EDITED DATA TAPE is in BCD, and the SORTED DATA TAPE is in binary.

All of the above subroutines will use the common write area (WCOM) where all the error messages and I/O macros are centered. Each of the above subroutines modifies certain locations in the WCOM area (as indicated on Page III-B-63). Operating all the writes through a standard routine gives a uniformity to all I/O messages set out in this system. The above subroutines

also have a block of data that sets up information for writing data and labels. This block of information is 22 words long and takes the following form:

(1) **XXTPE - 1 Word**

This identifies the tape unit on which this tape is to be found. This information is set in this location in WCOM after the tape selection routine.

(2) **W(X)60 - 3 Words**

This location will be the link to the XXTPE information which is used in writing. If the operation code is PZE the tape is written in the binary mode. If the code is MZE the tape is written in the BCD mode. Following the W(X)60 location will be the write commands for writing the label.

(3) **W(X)62 - 2 Words**

These words will contain the write communication information.

(4) **W(X)80 - 2 Words**

These words are parameters to be used with the write routine (see Subsec. 4.6). They will contain the location of the two buffers plus the blocking involved and individual record size if not variable.

(5) **W(X)82 - 2 Words**

This location will be the link to the XXTPE information which is used in writing the "NOTE OF" message at the physical end of a tape that is to be continued. The location following W(X)82 is the write command.

(6) **W(X)93 - 6 Words**

The new master file as-of date is set into this line and these six words will become the first label record on the tape.

(7) **W(X)95 - 4 Words**

This portion of a message is used for some of the messages set out during the I/O operation. The tape number is set into the last word of this message.

(8) **W(X)97 - 1 Word**

This location will hold the actual tape number in the form of X0000N, where X is the channel and N is the unit number.

(9) W(X)99 - 1 Word

This location will indicate whether this is the first time through this particular write subroutine. A non-zero value indicates this is not the first time through.

In the above, the X's indicate that this block is repeated for each write subroutine and each block will have a different letter in place of the (X).

READ and WRITE Error Messages On-Line

During the read and write operations certain error conditions are checked upon. If any of these conditions are found the message is printed out on-line, and the system will come to an unrecoverable stop. The same messages will be used for all reads except that the tape unit number will indicate the unit in trouble. The same will apply to writes. The following error messages are used with the input/output routines.

(a) ERROR IN READING FIRST RECORD OF

SORTED INPUT TAPE	XX
PRTCO MASTER TAPE	XX
SECONDARY PC TAPE	XX
SORTED TIME TAPE	XX
UNSORTED DATA TAPE	XX
EDITED DATA TAPE	XX
USERS PERT TIME TP	XX

If any combination of the first line and one of the next seven lines is set out on the on-line printer the system is stopped. This message will indicate that in trying to read the label record an error condition was found. The reason for this error condition is set into RM98 and the code breakdown is:

- 1 - Redundancy in reading
- 2 - End-of-file condition on first record

(b) ERROR IN WRITING FIRST RECORD OF

PRTCO MASTER TAPE	XX
SECONDARY PC TAPE	XX
EDITED DATA TAPE	XX

PRTCO CHANGE TAPE XX

SORTED TIME TAPE XX

If any combination of the first line and one of the next five lines is set out on the on-line printer the system is stopped. This message will indicate that in trying to write the label record an error condition was found.

- (c) THE SYSTEM WAS NOT ABLE TO READ TAPE XX
CORRECTLY

When a redundancy is found in reading the data on the indicated tape this message is set out and the system is stopped.

- (d) THE SYSTEM WAS NOT ABLE TO WRITE TAPE XX
CORRECTLY

When a write error is determined this message is set out on the on-line printer and the system is stopped.

- (e) PROGRAM ERROR IN READER ROUTINE

If there is an illogical combination of conditions existing for the reader routine, this message is set out on the on-line printer and the system is stopped. The reason for this stop is set into R(X)98 (Page III-B-3(10)).

- (f) PROGRAM ERROR IN WRITER ROUTINE

If there is an illogical combination of conditions existing for the writer routine, this message is set out on the on-line printer and the system is stopped. The reason for this stop is set into WP98. The codes will be explained in the writer routine

- (g) THE SYSTEM WAS NOT ABLE TO WRITE THE
NOTE OF MESSAGE ON PERT COST TAPE XX
NOTE OF MESSAGE ON SECONDARY TAPE XX
NOTE OF MESSAGE ON NEW EDIT TAPE XX
NOTE OF MESSAGE ON SRTD DATA TAPE XX
NOTE OF MESSAGE ON SRTD TIME TAPE XX

When this situation occurs the program will come to a complete halt. This message will indicate write problems for the tape shown.

- (h) THE SYSTEM WAS NOT ABLE TO READ TAPE XX AFTER THE EOF

In looking for the continue message or a second E. O. F. the system encountered a redundancy error. This error is recoverable and, prior to halting, a second line to the above message is printed:

IF LABEL IS TO BE IGNORED HIT START BUTTON TO CONTINUE

The program assumes this is a legitimate EOF condition and if the START button is hit it will handle this tape as though it had two EOF's in a row.

- (i) ATTEMPTING TO READ SORTED CHANGE TAPE AND CANNOT LOCATE END OF FILE ON EDITED TAPE XX

This message indicates that there is not any EOF to separate the edited information from the sorted. It will be followed by two additional messages with a recovery mode. These messages are:

VERIFY THAT THE PROPER REEL IS ON THIS UNIT

IF PROPER REEL IS PLACED ON UNIT HIT START

After printing out this last message the system will stop. If the right reel for this information is located, and set on its proper unit, the START button can be hit. The program will then continue searching through this new reel for the split between the information.

Tape Labels

Each of the tapes created during any processing run will have a label set on as its first two records. This label will indicate the type of tape, the date it was created, the tape series number, and the program this tape is associated with. A label will also be set at the end of a physical tape that is to be continued. The only variance from the label described above will be the INPUT DATA TAPE, which will use a 4-word label indicating the type of data (see Subsec. III-D), and the USERS TIME TAPE, whose label is variable and depends upon the time system used. The following will describe the common makeup of the tape label.

(a) LABEL FIRST RECORD - WRITE

The first record of every created tape after the tables (see Page III-B-11), other than the SYSTEM OUTPUT TAPE, will be six words long. This record will contain the Master File as-of date in the date slot and will begin numbering the tapes with 1 up to 9. This label will take one of the following forms:

PERT COST MASTER FILE DDMMYY TPE X
SECONDARY MASTER FILE DDMMYY TPE X
EDITED RAW DATA TAPE DDMMYY TPE X
PERT COST CHANGE FILE DDMMYY TPE X
PERT COST TIME INPUT DDMMYY TPE X

During some options the Secondary or PERT Cost tapes are duplicated without updating. If this is the case the first record of the label written out will be the same as the record read in; that is, the master file date for that tape will remain the same.

(b) LABEL SECOND RECORD - WRITE

The second record of every created tape after the tables, aside from the SYSTEM OUTPUT TAPE, will be four words long and will contain the program name found on control card "A". In any case, even for the duplication effort as explained above, the new or current program name will be set into this record.

(c) LABEL FIRST RECORD - READ AND COMPARE

For the input data tapes, only the first four words of the label are checked. For all others except the USERS TIME TAPE, the entire first record is read into R(X)90 and is verified against R(X)93. The date set into R(X)93 is set in from the "A" control card. The following will indicate the dates from the "A" card used for checking the label.

For SORTED INPUT TAPE: The new Master File as-of date since this tape was created for this run.

For PERT COST MASTER TAPE: The PERT Cost master date on the "A" control card. If Option C or E, the label is not verified.

For SECONDARY MASTER TAPE: The secondary master date on the "A" control card. If Option G, the label is not verified.

For PERT COST TIME INPUT: In Option G, the PERT TIME TAPE date on the "A" control card. On other options where the USER TIME TAPE is used, the PERT TIME date on the "A" control tape is verified with the report date on the Users tape.

For INPUT DATA TAPE: No date verification is made on this set of tapes.

For EDITED DATA TAPE: The new master file as-of date since this tape was created for this run.

(d) LABEL SECOND RECORD - READ AND COMPARE

The last four words in R(X)90 are compared to the old program name in PNHD2. If there has been no program name change, the current name in PNHL D will be set into PNHD2. If there has been a name change PNHL D will contain the new name for the labels written out and PNHD2 will contain the old name for comparing.

(e) END LABEL - WRITE

If a tape is to be continued onto another reel after hitting the end-of-tape indication, a 1-word record is set up after the end-of-file. This record will appear as:

NOTEOF

Following this record will be another end-of-file.

(f) END LABEL - READ AND COMPARE

If a tape is being read and an end-of-file is encountered, the next record is checked for "NOTEOF." If it contains this record, the program will continue to read the next tape of the series set on the unit. If, instead of NOTEOF, the program finds another end-of-file it will assume the tape is actually at end-of-file.

Label On-Line Messages

All messages referring to labels will be set out on-line. Most of the label errors can be circumvented and the processing continued by action at the

console. The messages that are involved with label problems are listed and described below:

(a) THE LABEL DID NOT CHECK IN READING TAPE XX

The line following the above message will indicate the label record being compared. All 10 words of this record will be printed out on a single line. For example:

PERT COST MASTER FILE 010563 TPE 1 (Program Name)

After this message the following information is printed out:

VERIFY THAT PROPER REEL IS ON THIS UNIT.

IF LABEL IS TO BE IGNORED HIT START BUTTON TO CONTINUE.

At this point the system will stop. If this label is to be ignored, pressing the START button on the console will continue the program.

(b) THE CONTINUE LABEL DID NOT CHECK IN THE READING OF

SORTED INPUT TAPE XX

PRTCO MASTER TAPE XX

SECONDARY PC TAPE XX

SORTED TIME TAPE XX

EDITED DATA TAPE XX

Any combination of the first line and one of the following lines of the message will indicate on which tape the end label was not legitimate. This message will be followed by another message as follows:

IF LABEL IS TO BE IGNORED HIT START BUTTON TO CONTINUE.

If the start button is hit, the program assumes that another tape of this series is being set on this unit.

READ and WRITE of Tables

The double-buffered read or write routine is not used for the reading and writing of the tables. Since most of these tables are one record long, a nonbuffered read or write is used. Each table will carry its own label, which

will be located just prior to the main record. The following will be the format on these labels:

PERT TIME INPUT PARAMETERS DDMMYY
RATE TABLE PARAMETERS DDMMYY
SKILL CODE TO RAINBOW GROUP DDMMYY

These labels will each be one record of six words, and the date carried in the label is picked up from the "A" control card. When the label is being written out for the tables on the new masters, the date used is the new master file date on control card "A". When the labels are being read and compared, the secondary master file date is set into the input parameter record from control card "A" located in the record at R(X)40 of the information tables of RCOM2. The rate table and skill table will use the PERT COST master date. The same conditions that apply to the read and writing of the PERT Cost and Secondary Master labels (see Page III-B-9 (c)) will apply to the tables located on their respective tapes.

The read and write subroutines will accomplish the reading and writing function for the following tables:

- (a) INPUT PARAMETERS READ (RINP)
A record of 350 words will make up the input parameters. This is the first record on the secondary master. This routine will bring this record off of tape into core.
- (b) INPUT PARAMETERS WRITE (WINP)
This routine will pick up these data in one record block, except for the label which is a separate record, and set it out on tape.
- (c) RATE TABLE READ (RRTB)
A record of 4003 words will make up the rate table. This is the first record on the PERT Cost master. This routine will bring the record off of tape into core.
- (d) RATE TABLE WRITE (WRTB)
This routine will pick up these data in one record block, except for the label, which is a separate record, and set it out on tape.

(e) SKILL TABLE READ (RSTR)

A record of 1080 words will make up the skill table. This is the third record following the rate table label and rate table on the PERT Cost master. This routine will bring the record off of tape into core.

(f) SKILL TABLE WRITE (WSTR)

This routine will pick up these data in one record block, except for the label, which is a separate record, and set it out on tape.

All of the above subroutines will use the common read area (RCOM2) or the common write area (WCOM2), where all the error messages and I/O macros are centered. Each of the above subroutines modifies certain locations in either the RCOM2 area (See Page III-B-51) or WCOM2 area (see Page III-B-72). Operating all the I/O from a standard routine will give a uniformity to all messages set out in the system. Each of the above subroutines will have a block of data for reading or writing and label checking and setup. This block of information for RCOM2 is 21 words long, according to the following form:

(1) R(X)25 - 3 Words

The first word of this set will indicate the location that will contain the tape unit number for reading, plus the communication cells. The next location will be the label read followed by the table read.

(2) R(X)28 - 2 Words

These words will contain the read communication information.

(3) R(X)30 - 1 Word

This word contains the tape unit number indicating the unit this tape is to be found on. This information is set in this location in RCOM2 after the tape selection routine.

(4) R(X)40 - 6 Words

The label read from tape is set into this location.

(5) R(X)41 - 6 Words

The secondary master date or PERT Cost master date from control card "A" is set into its respective location in this record and it is verified with R(X)40.

(6) R(X)70 - 3 Words

This portion of a message is used with some of the messages set out during this read operation.

The block of information for WCOM2 is 6 words long, and takes the following form:

(i) W(X)25 - 3 Words

The first word of this set will indicate the location that will contain the tape unit number for writing, plus the communication cells. The last location of this set will be the core area plus the number of words that are to be written preceded by the label write.

(ii) W(X)28 - 2 Words

These words will contain the write communication information.

(iii) W(X)30 - 1 Word

This word contains the tape unit number that indicates which unit this tape is to be found on. This information is set in this location in WCOM2 after the tape selection routine.

The X's indicate that this block is repeated for each read or write (R(X) for reads, W(X) for writes), but each block will have a different letter in place of the (X).

Table On-Line Messages

The table on-line messages will be set out during the reading or writing of the table records and their labels. If the error is an I/O problem the message will be printed out and the system will completely stop. If the error is a label problem a message will be printed out and the system will halt with an option to continue if the label is to be ignored. The following are the messages that will be forthcoming.

(a) THE LABEL DOES NOT AGREE IN READING

INPUT PARAMETERS

RATE TABLE

SKILL TABLE

The first line of the above message plus any one of the next three lines will be followed by the message:

IF LABEL IS TO BE IGNORED HIT START BUTTON
TO CONTINUE

At this point the system will stop. If this label is to be ignored, pressing the start button on the console will continue the program.

(b) READIN ERROR ENCOUNTERED ON

INPUT PARAMETERS

RATE TABLE

SKILL TABLE

If any combination of the first line and one of the next three lines is set out on the on-line printer, the system is stopped. This message will indicate that in trying to read the label or table an I/O error condition was found.

(c) WRITE ERROR ENCOUNTERED ON

INPUT PARAMETERS

RATE TABLE

SKILL TABLE

If any combination of the first line and one of the next three lines is set out on the on-line printer, the system is stopped. This message will indicate that in trying to write the label or table an I/O error condition was found.

WRITE Finish-up Routines

After completing the writing of all newly created tapes, a finish-up process is initiated. This sets up the E. O. F. 's and unloads the tapes by means of the following subroutines:

(a) FINISH UP NEW PERT COST MASTER (WDNP)

The double E. O. F. and the rewinding and unloading of the last NEW PERT COST MASTER are accomplished in this subroutine.

(b) FINISH UP NEW SECONDARY MASTER (WDNS)

The double E. O. F. for the last NEW SECONDARY MASTER is accomplished in this subroutine. This tape is never rewound or unloaded, since the NEW PERT COST MASTER will begin where it finishes off.

(c) FINISH UP EDITED DATA TAPE (WDNE)

The double E. O. F. for the last EDITED DATA TAPE is accomplished in this subroutine. This tape is never rewound or unloaded, except in Option A, since the SORTED DATA TAPE will begin where it finishes off.

(d) FINISH UP SORTED DATA TAPE (WDST)

The double E. O. F. and the rewinding and unloading of the last SORTED DATA TAPE are accomplished in this subroutine.

(e) FINISH UP SORTED TIME TAPE (WDTT)

The double E. O. F. and the rewinding and unloading of the last SORTED TIME TAPE are accomplished in this subroutine.

The only I/O problem that can occur in the above subroutines is in writing the two E. O. F. 's. The error messages that will be forthcoming for this error will be:

THE SYSTEM WAS NOT ABLE TO WRITE THE

E. O. F. ON THE PRTCO TAPE XX

E. O. F. ON SECONDARY TAPE XX

E. O. F. ON THE EDITED TAPE XX

E. O. F. ON SORTED DATA TAPE XX

E. O. F. ON SORTED TIME TAPE XX

The first line of the above message plus any one of the next five lines will be followed by the message:

MANUALLY WRITE E. O. F. TWICE ON THE ABOVE TAPE
UNIT THEN HIT START.

At this point the system will stop. After complying with the last message, the START button on the console is hit to continue the program.

INPUT/OUTPUT by Options

Table III-B-1 will show the input/output subroutines used for any particular option. It will also show the labels that are to be verified, as well as the labels that are to be set out on the output tapes. The following is an explanation of the fields used:

OPTION (Column 1)

The program option selected is found in this field.

TAPES (Column 2)

This field contains the name of the tape that is involved in an input/output operation. Where more than one tape is involved, it will refer to the grouping of tapes and only the Remarks field will have any bearing.

BCD OR BINARY (Column 3)

This field indicates the mode of reading or writing: BCD = BCD mode; BIN = binary mode.

TYPE OF I/O (Column 4)

This field indicates whether the action for that particular tape is read (R) or write (W).

READER OR WRITER USAGE (Column 5)

An "X" in this field indicates that for this particular tape the reader or writer subroutine is used.

I/O LINKAGE WITH XR 4 (Column 6)

This field gives the name of the subroutine where the input/output action for this tape takes place. All TSX's into the input/output subroutines use Index Register 4.

REWIND (Column 7)

An "X" indicates that this particular tape will be rewound at the end of its processing.

UNLOAD (Column 8)

An "X" indicates that this particular tape will be rewound at the end of its processing.

LABELS (Column 9)

This field shows the label that is to be checked in read-in or the label that is set out on the output tapes.

LABEL RECORDS (Column 10)

A number in this field indicates the number of physical records that make up the label for a particular tape.

LABEL WORDS (Column 11)

This column shows the number of words that will make up the physical record indicated in the preceding column.

BLOCKING USE (Column 12)

This field will indicate by a "Yes" or a "No" whether the data for a particular tape contains blocked or unblocked records, respectively.

NUMBER OF LOGICAL RECORDS PER BLOCK (Column 13)

If blocking is indicated, the maximum number of records in any one block is shown in this column. If it is variable a "V" will indicate this condition.

BLOCK SIZE (Column 14)

If blocking is indicated, the maximum size of the blocked record is shown here.

REMARKS (Column 15)

Any remark that is pertinent to that particular tape during a particular option is noted here. For the case where the information on a tape is the same as in a lower option, the tape is referenced to that option.

Option (1)	Tapes (2)	BCD or Binary (3)	Type I/O (4)	Read or Write Usage (5)	I/O to or from Linkage (6)	Re- wind (7)	Un- load (8)	Labels (9)	Label			Blocking		Remarks (15)
									No. Rec- ords (10)	No. Words (11)	Use (12)	No. Logical Records (13)	Block Size (14)	
A	Input data tape	BCD	R	X	RRWD	X	X	Actual raw data tape Unsorted raw data tape Edited raw data tape DDMMYY TPE *	1 1 2	4 4 6	No			Alternating tapes Only check last 4 words
	Edited data tape	BCD	W	X	WRWD	X	X	Program name Edited raw data tape DDMMYY TPE *	2 2	4 6	No			
B	Input data tape	BCD	R	X	RRWD	X	X				No			Same as Option A. If the second of the alter- nating tapes is used it is not unloaded since it will be used for the sort phase
	Edited data tape	BCD	W	X	WRWD	X					No			Same as Option A (except) If more than one tape has been created this tape is unloaded and the first of the series is set on
	Edited data tape	BCD	R	X	REDD			Edited raw data tape DDMMYY TPE *	2	6	No			Into sort routine
	Sorted data tape	BIN	W	X	WCIG	X	X	PERT Cost change file DDMMYY TPE *	2	6	Yes	10	200	Same physical tape as edited tape (second file) after sort completion
C	Input data tape	BCD	R	X	RRWD	X					No			Same as Option A (except). The last two input tapes are unloaded since they will be used for the new master and sort tapes.
	Edited data tape	BCD	W	X	WRWD	X					No			Same as Option B
	Edited data tape	BCD	R	X	REDD						No			Same as Option B (except)
	Sorted data tape	BIN	W	X	WCIG	X	X	PERT Cost change file DDMMYY TPE *	2	6	Yes	10	200	Read past first file to begin picking up sorted input data
	Sorted data tape	BIN	R	X	RCIG	X		Program name	1	4	No			One record will make up the input parameters
	Old input parameters	BIN	R		RINP			PERT Time input param- eters DDMMYY	1	6	No			
	Old secondary master	BIN	R	X	ROSM			Secondary master file DDMMYY TPE *	2	6	Yes	75	600	Not reworded since old PERT Cost master is 2nd file on this tape
	New input parameters	BIN	W		WINP			PERT Time input param- eters DDMMYY	1	6	No			One record will make up the input parameters

(Continued)

Table III-B-1 INPUT/OUTPUT Tape Usage by Option Selection

Option (1)	Tapes (2)	BCD or Binary (3)	Type of I/O (4)	Read or Write Usage (5)	I/O to XR 4 Linkage (6)	Re- wind (7)	Un- load (8)	Labels (9)	Label		Blocking		Remarks (15)	
									No. Reco- rds (10)	No. Words (11)	Use (12)	No. Logical Records (13)		Block Size (14)
G cont.	New secondary master	BIN	W	X	WNSM			Secondary master file DDMMVY Tape #	2	6	Yes	75	600	Not rewound since new PERT Cost master is 2nd file on this tape
	Old PERT Cost master	BIN	R	X	ROSM	X	X	Program name PERT Cost master file DDMMVY Tapes	2	6	Yes	V	600	Skip over rate table and skill table to cost data info - interested only in responsible organ. and charge no descrip- tion in cost data record for work package/activity worksheet.
	Users time tape		R	X	PARMD	X	X	Program name		4				Information regarding this tape is dependent upon input parameters-it has its I/O operations in PERT merge phase.
	Sorted time tape	BIN	W	X	WSTT	X	X	PERT Cost time input DDMMVY Tapes	2	6	Yes	16	576	This tape is developed after the completion of the sort. It can be on one of two tapes depending on the merge passes of the sort.
	PERT Cost master info.	BIN	R/W		WRNRM WRTH WSTTR RRTN RSTR			Program name		4				Duplicate the PERT Cost data as the second file of PERT Cost master label dates will re- main the same
D	Input data tape	BCD	R	X	RRWD	X					No			Same as Option A (unload) Do not unload last 2 input tapes - to be used for new PERT Cost master and one of the sort tapes
	Filled data tape	BCD	W	X	WRWD	X					No			Same as Option B
	Edited data tape	BCD	R	X	REDD	X					No	10	200	Same as Option B
	Sorted data tape	BIN	W	X	WCKG	X	X				Yes	10	200	Same as Option C
	Sorted data tape	BIN	R	X	ICIG	X					No			Same as Option C
	Old input parameters	BIN	R	X	RINP						Yes	75	600	Same as Option C
	Old secondary master	BIN	R	X	ROSM						No			Same as Option C
	New input parameters	BIN	W	X	WINP		X				Yes	75	600	Same as Option C
	New secondary master	BIN	W	X	WNSM	X					No			One record will make up the rate table
	User time tape	BIN	R	X	PARMD	X	X	Rate table parameters DDMMVY	1	6	No			On old PERT Cost master
	Old rate table	BIN	R	X	RRTN						No			One record will make up the skill table
	Old skill table	BIN	R	X	RSTR			Skill code to Relshow Group DDMMVY	1	6	No			On old PERT Cost master

(Continued)

(Continued)

Table III-B-1 INPUT/OUTPUT Tape Usage by Option Selection (Continued)
III-B-20

Table 3 L-9

Option (1)	Tapes (2)	BCD or Binary (3)	Type of I/O (4)	Read or Write Usage (5)	I/O to SR-4 Linkage (6)	Rt. wind (7)	Un- load (8)	Labels (9)	Label			Blocking			Remarks (15)
									No. Rec- ords (10)	No. Words (11)	Use (12)	No. Logical Records (13)	Block Size (14)		
D cont	Old PERT Cost master	BIN	R	X	RODM	X	X	Rate table parameters DDMMYY SKILL code to Rainbow Group DDMMYY PERT Cost master file DDMMYY TPE: Program name	1	6	Yes	Y	600	Same as Option C (remarks for 2) One record will make up the rate table On new PERT Cost master	
	New rate table	BIN	W		WRTH		No				No			One record will make up the skill table On new PERT Cost master	
	New skill table	BIN	W		WSTR						Yes	Y	600		
	New PERT Cost master	BIN	W	X	WNDM	X	X		2	6	Yes	Y			
E	Sorted data tape	BIN	R	X	RCRG	X	X				Yes	10	200	Same as Option C	
	Old input parameters	BIN	R	X	RIND	X	X				No		600	Same as Option C	
	Old secondary master	BIN	R	X	ROSM	X	X				Yes	7%		Same as Option C	
	New input parameters	WIN	W	X	WNSM	X	X				No		600	Same as Option C	
	New secondary master	BIN	W	X	RODM	X	X				Yes	7%		Same as Option D	
	Old PERT Cost master	BIN	R	X	PNRD	X	X				Yes	Y	600	Same as Option C	
	Users time tape	WIN	R	X	WSTR	X	X				Yes	16	576	Same as Option C	
	Sorted time tape	BIN	W	X	WSTR						Yes			Same as Option C	
	PERT Cost master info.	BIN	R/W		WNPM						Yes			Same as Option C	
		WIN	R	X	RCRG	X	X				Yes	10	200	Same as Option C	
		WIN	R	X	RIND	X	X				No		600	Same as Option C	
		WIN	W	X	WNSM	X	X				No		600	Same as Option C	
F	Sorted data tape	BIN	R	X	RCRG	X	X				Yes	10	200	Same as Option C	
	Old input parameters	WIN	R	X	RIND	X	X				No		600	Same as Option C	
	Old secondary master	BIN	R	X	ROSM	X	X				Yes	7%		Same as Option C	
	New input parameters	WIN	W	X	WNSM	X	X				No		600	Same as Option C	
	New secondary master	BIN	W	X	RODM	X	X				Yes	7%		Same as Option C	
	Users time tape	WIN	R	X	PNRD	X	X				No		600	Same as Option C	
	Old rate table	BIN	R	X	WRTH						No			Same as Option D	
	Old skill table	BIN	R	X	WSTR	X	X				No		600	Same as Option D	
	Old PERT Cost master	BIN	R	X	RODM	X	X				Yes	Y		Same as Option D	
	New rate table	BIN	W	X	WRTH						No			Same as Option D	
	New skill table	WIN	W	X	WSTR	X	X				No		600	Same as Option D	
	New PERT Cost master	BIN	W	X	WNDM	X	X				Yes	Y		Same as Option D	
G	Input data tape	BCD	R	X	RRWD	X					No			Same as Option A (initial) The last two input tapes are not unloaded since they will be used for the new master and sort tapes Same as Option B	
	Edited data tape	BCD	W	X	WRWD	X					No				

Table III-B-1 INPUT/OUTPUT Tape Usage by Option Selection (Continued)

Option (1)	Tapes (2)	BCD or Binary (3)	Type of I/O (4)	Read or Write Usage (5)	I/O to XR 4 Linkage (6)	Re- wind (7)	Un- load (8)	Labels (9)	Label			Blocking		Remarks (15)
									No. Rec- ords (10)	No. Words (11)	Use (12)	No. Logical Records (13)	Block Size (14)	
G cont	Edited data tape	BCD	R	X	RCD	X	X	PERT Cost time input DUMMYY TPRS			No	10	200	Same as Option B
	Sorted data tape	BIN	W	X	WCHG	X	X				Yes	10	200	Same as Option B
	Sorted data tape	BIN	R	X	RGHG	X	X		1	6	Yes	10	976	Same as Option C
	Sorted time tape	BIN	R	X	RSTT	X	X	Program name			Yes	10		If indicator to set this tape can be bypassed during this option
	Old rate table		R		RRTB					4	No			
	Old skill table		R		RSTR						No			Same as Option D
	Old PERT Cost master		R		ROIM	X	X				Yes	V	600	Same as Option D
	New rate table		W		WRTH						No			Same as Option D
	New skill table		W		WSTR						No			Same as Option D
	New PERT Cost master		W		WPTM	X	X				Yes	V	600	Same as Option D
	Secondary master info.	BIN	R/W		RNP WINP ROSM WNSM									Duplicate this data as first bits of new PERT Cost master. Label dates will remain the same
N/A	Edited data tape	BCD	W		WONP			Finish up the writing of these tapes						
	Sorted data tape	BIN	W		WOST									
	New secondary master	BIN	W		WONS									
	Sorted time tape	BIN	W		WOTT									
	New PERT Cost master	BIN	W		WONP									

Table III-B-1 INPUT/OUTPUT Tape Usage by Option Selection (Continued)

INPUT/OUTPUT Region Descriptions

The following region specifications will describe the major subroutines used in the input/output region.

Region RCHG

EXPLANATION OF REGION:

This routine will read the SORTED DATA TAPE, which is the second file following the edited data information.

CALLING SEQUENCE:

L	TSX RCHG, 4
L + 1	Normal return

INPUT:

SORTED DATA TAPE

OUTPUT:

The location of the next logical record is in the address of the accumulator. The number of words contained in this record is in the decrement.

STORAGE USED:

CFDTE - RC99 - 31 words

SUBREGIONS AND SUBROUTINES USED:

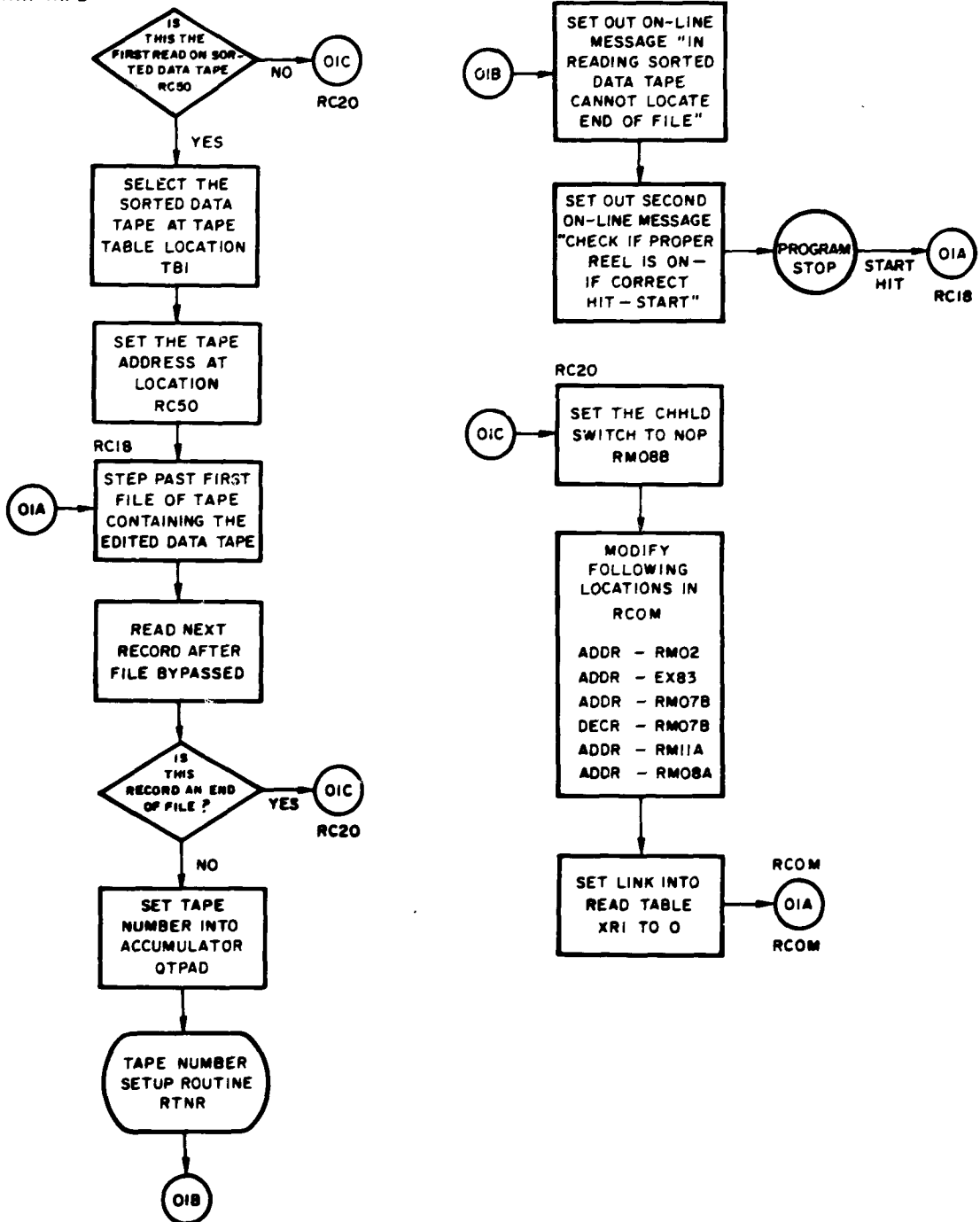
TAPSN RCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in reading, a message is set out on the on-line printer and the program is stopped. If an E. O. F. is encountered, the program will automatically go into its E. O. F. exit.

REGION RCHG

READ SORTED DATA TAPE



Region ROPM

EXPLANATION OF REGION:

This routine will read the OLD PERT COST MASTER, which is the second file preceding the secondary information.

CALLING SEQUENCE:

L TSX ROPM, 4
L + 1 Normal return

INPUT:

OLD PERT COST MASTER

OUTPUT:

The location of the next logical record is in the address of the accumulator. The number of words contained in this record is in the decrement.

STORAGE USED:

PCDAT - RP99 - 31 words

SUBREGIONS AND SUBROUTINES USED:

RCOM

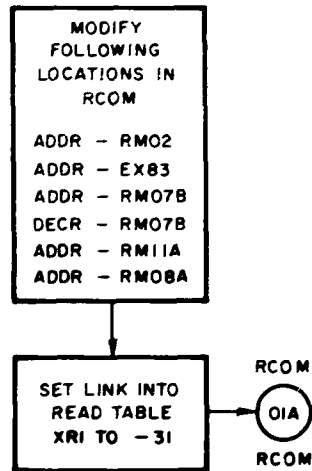
EXPLANATION OF CALLING SEQUENCE:

If an error is determined in reading, a message is set out on the on-line printer and the program is stopped. If an E. O. F. is encountered the program will automatically go into its E. O. F. exit.

REGION ROPM

READ OLD
PERT COST
MASTER TAPE

ROSM



Region ROSM

EXPLANATION OF REGION:

This routine will read the OLD SECONDARY MASTER which is the first file of the OLD PERT COST MASTER

CALLING SEQUENCE:

L TSX ROSM, 4
L + 1 Normal return

INPUT:

OLD PERT COST MASTER

OUTPUT:

The location of the next logical record is in the address of the accumulator. The number of words contained in this record is in the decrement.

STORAGE USED:

SMDAT - RS99 - 31 words

SUBREGIONS AND SUBROUTINES USED:

RCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in reading, a message is set out on the on-line printer and the program is stopped. If an E. O. F. is encountered the program will automatically go into its E. O. F. exit.

REGION ROSM

READ OLD
SECONDARY
MASTER TAPE

ROSM

MODIFY
FOLLOWING
LOCATIONS IN
RCOM

ADDR - RMO2
ADDR - EX83
ADDR - RMO7B
DECR - RMO7B
ADDR - RMI1A
ADDR - RMO8A

SET LINK INTO
READ TABLE
XRI TO -62

RCOM

OIA

RCOM

RS50

OIA

SET OUT ON-LINE
MESSAGE
"COMPLETED
READING
OF SECONDARY
MASTER"

SET OUT SECOND
LINE OF ON-LINE
MESSAGE
"***DO NOT REWIND"

PX20

O2C

EOFSM

Region RRWD

EXPLANATION OF REGION:

This routine will read the INPUT DATA TAPE one record at a time.

CALLING SEQUENCE:

L TSX RRWD, 4
L + 1 Normal return

INPUT:

INPUT DATA TAPES

OUTPUT:

The location of the next logical record is in the address of the accumulator, the number of words contained in this record is in the decrement.

STORAGE USED:

RDDAT - RW99 - 31 words

SUBREGIONS AND SUBROUTINES USED:

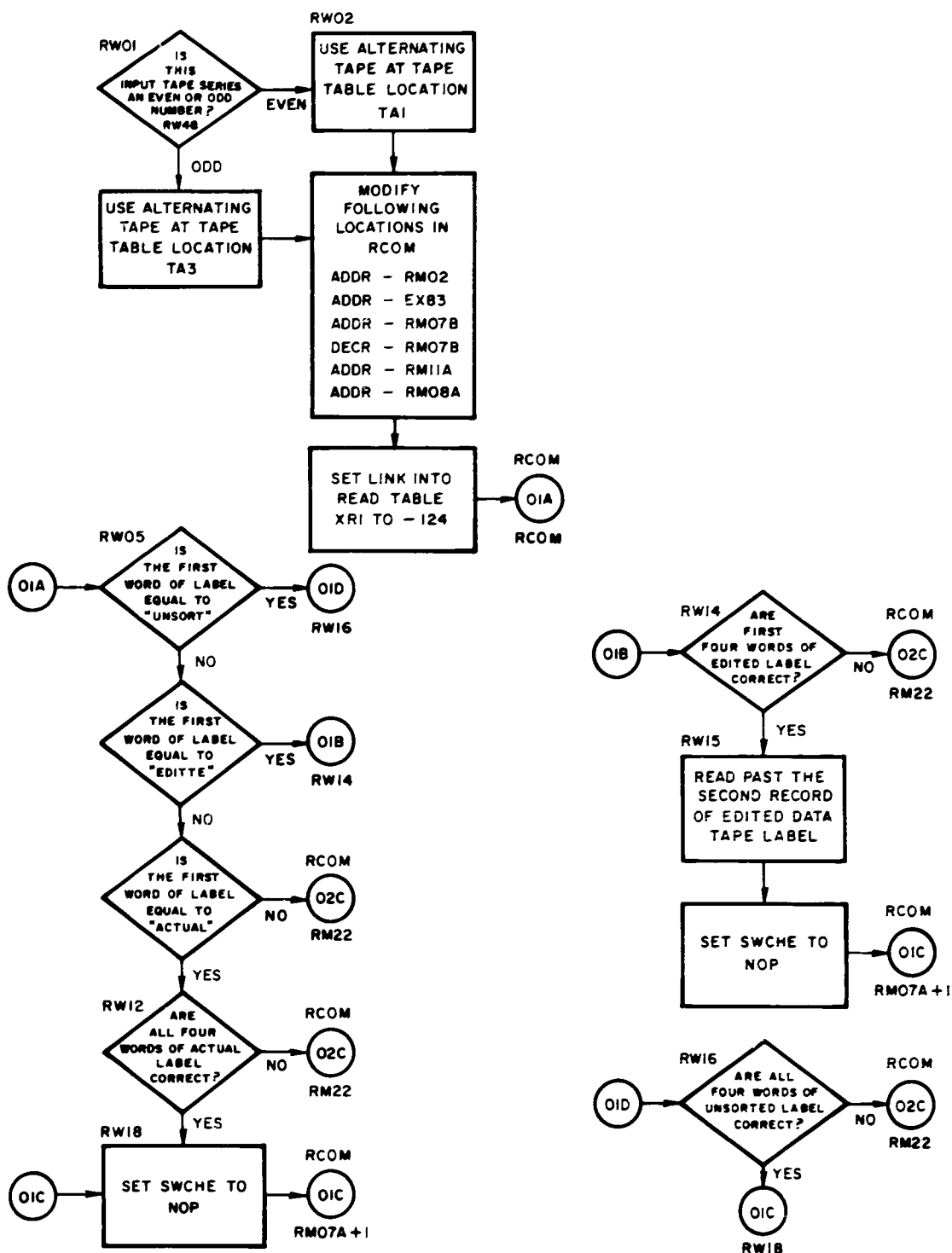
RECOM

EXPLANATION OF CALLING SEQUENCE:

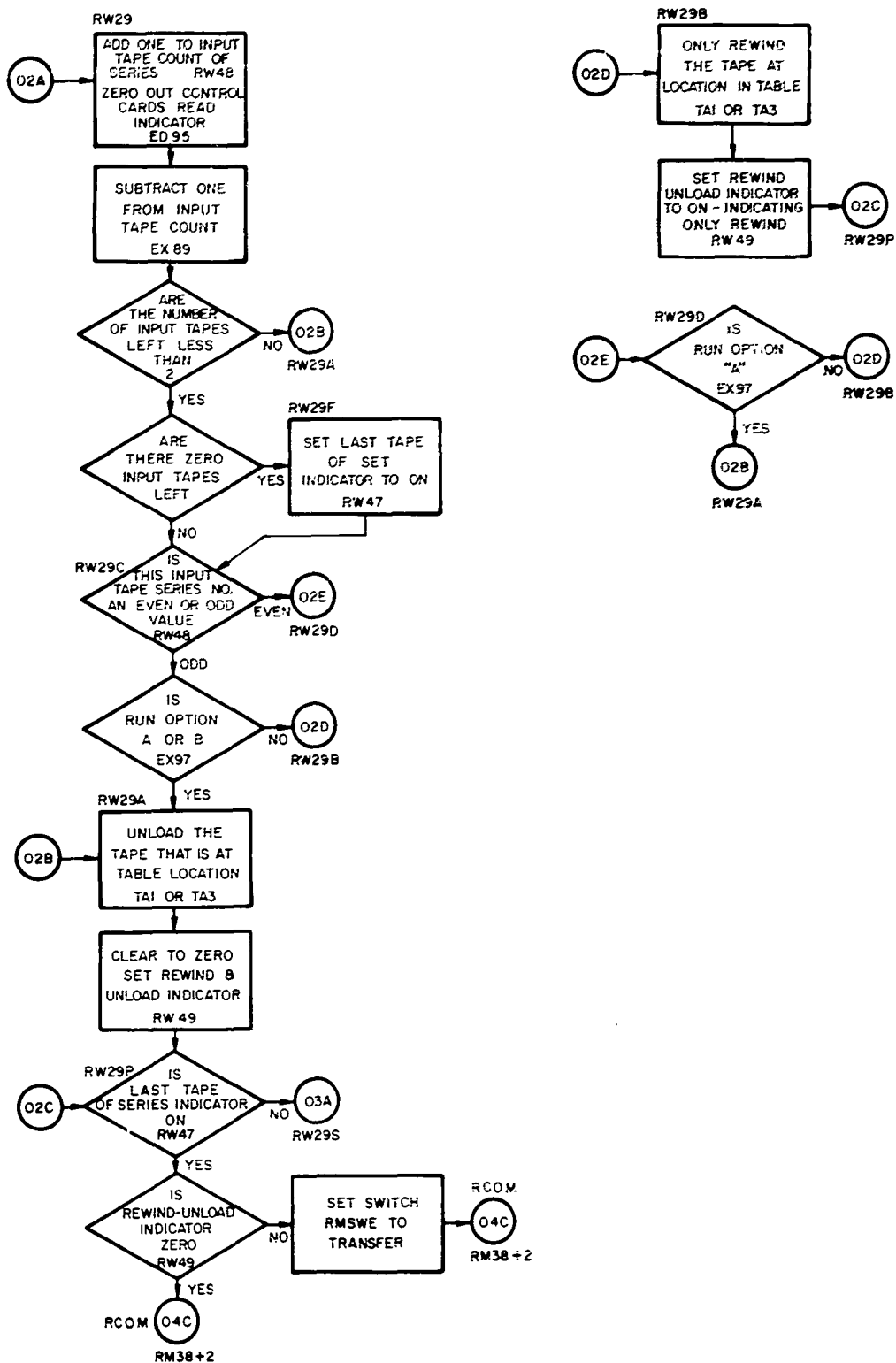
If an error is determined in reading, a message is set out on the on-line printer and the program is stopped. If an E. O. F. is encountered the program will automatically go into its E. O. F. exit.

REGION RRWD

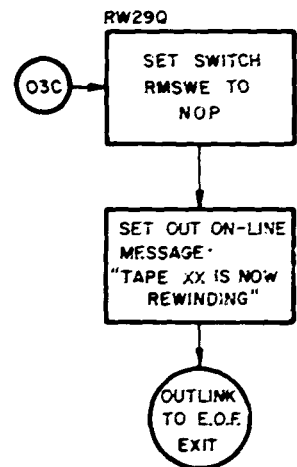
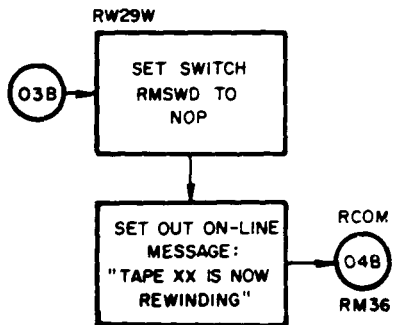
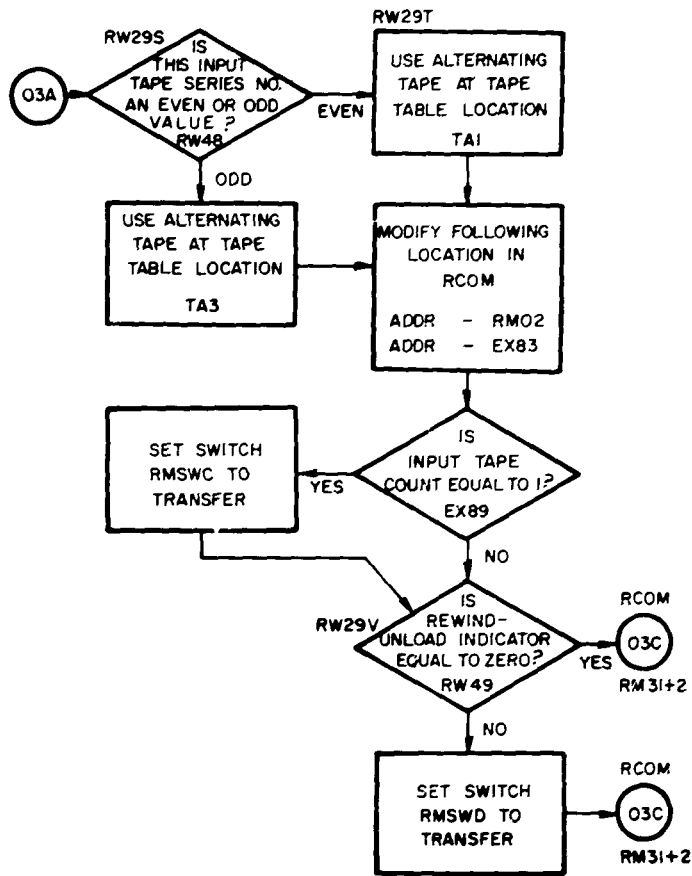
READ THE RAW DATA TAPE



REGION RRWD



REGION RRWD



Region REDD

EXPLANATION OF REGION:

This routine will read the EDITED DATA TAPE for input into the sort routine.

CALLING SEQUENCE:

L TSX REDD, 4
L + 1 Normal return

INPUT:

EDITED DATA TAPE

OUTPUT:

The location of the next logical record is in the address of the accumulator. The number of words contained in this record is in the decrement.

STORAGE USED:

EDDAT - RE99 - 31 words

SUBREGIONS AND SUBROUTINES USED:

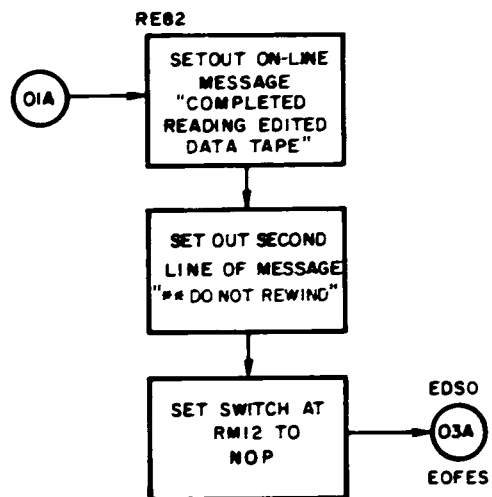
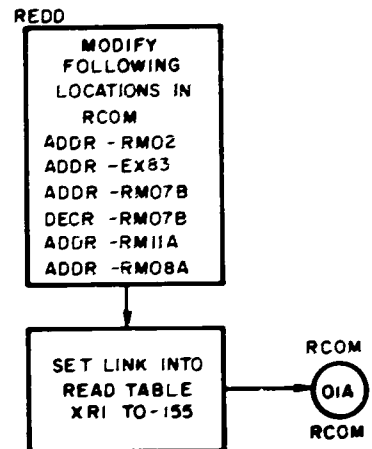
RCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in reading, a message is set out on the on-line printer and the program is stopped. If an E. O. F. is encountered the program will automatically go into its E. O. F. exit.

REGION REDD

READ EDITED
DATA TAPE



Region RSTT

EXPLANATION OF REGION:

This routine will read the SORTED TIME TAPE. If the option is C or E it will create at this time a physical SORTED TIME TAPE to be read during option G.

CALLING SEQUENCE:

L TSX RSTT, 4
L + 1 Normal return

INPUT:

SORTED TIME TAPE

OUTPUT:

The location of the next logical record is in the address of the accumulator. The number of words contained in this record is in the decrement.

STORAGE USED:

SPDAT - RA99 - 31 words

SUBREGIONS AND SUBROUTINES USED:

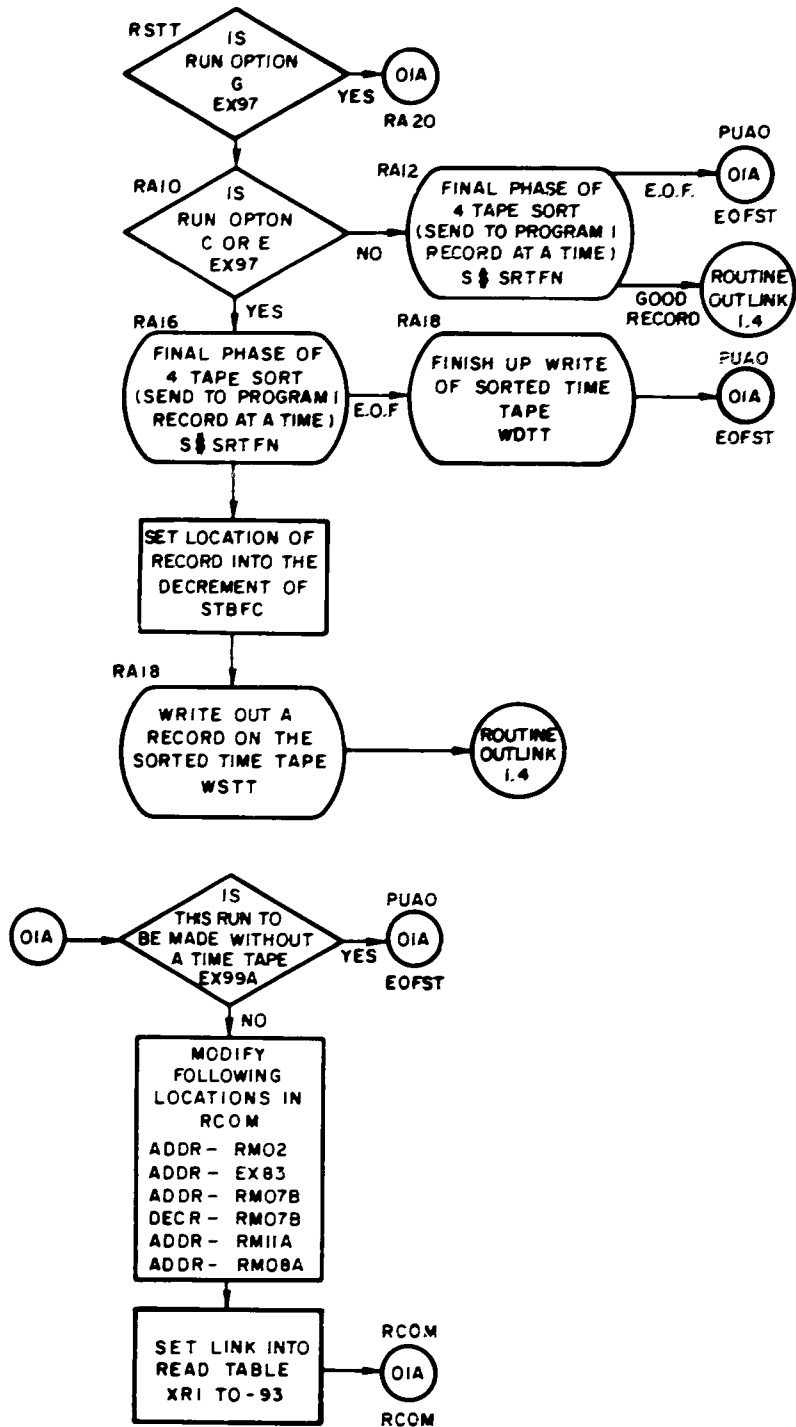
RCOM
WSTT
WDTT

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in reading, a message is set out on the on-line printer and the program is stopped. If an E. O. F. is encountered the program will automatically go into its E. O. F. exit.

REGION RSTT

READ SORTED
TIME TAPE



Region RCOM

EXPLANATION OF REGION:

This routine will set up all the error messages and operate the read routine for the PERT Cost program.

CALLING SEQUENCE:

L TRA RCOM

INPUT:

The following locations are to be modified in the subroutine that uses this routine:

RM09	- Save XR1	RM07B	} Indirect location of tape no.
RM 10	- Save XR4	RM11A	
RM02	- Location of tape no.	RM08A	
RM07B	- Decr - Location of buffers		

OUTPUT:

The first time this routine is entered for a tape, an on-line message is printed out indicating that the program is reading this tape. All unloads or rewinds are also set out on the printer.

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

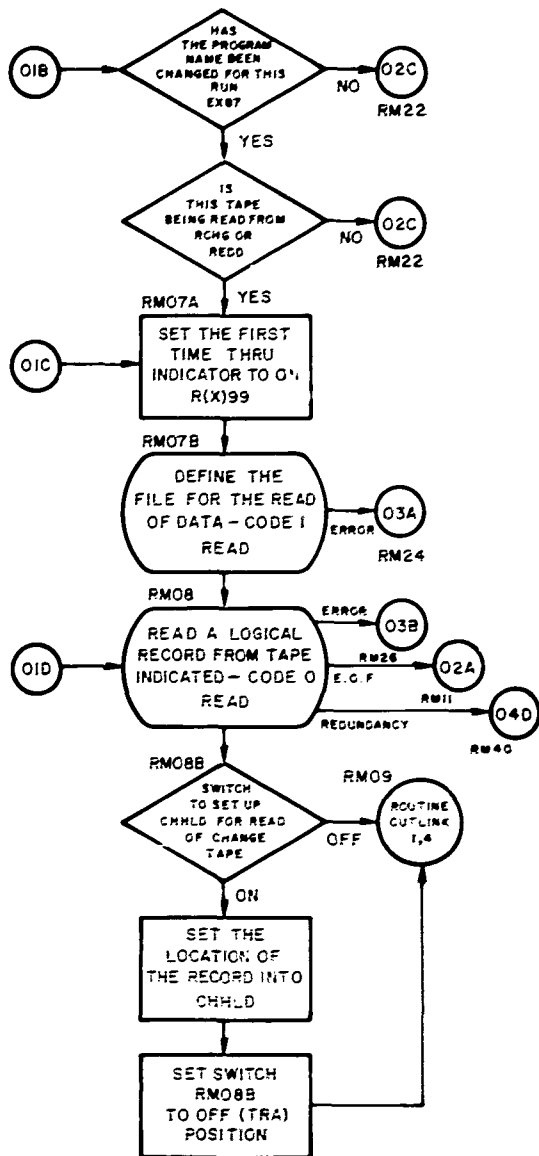
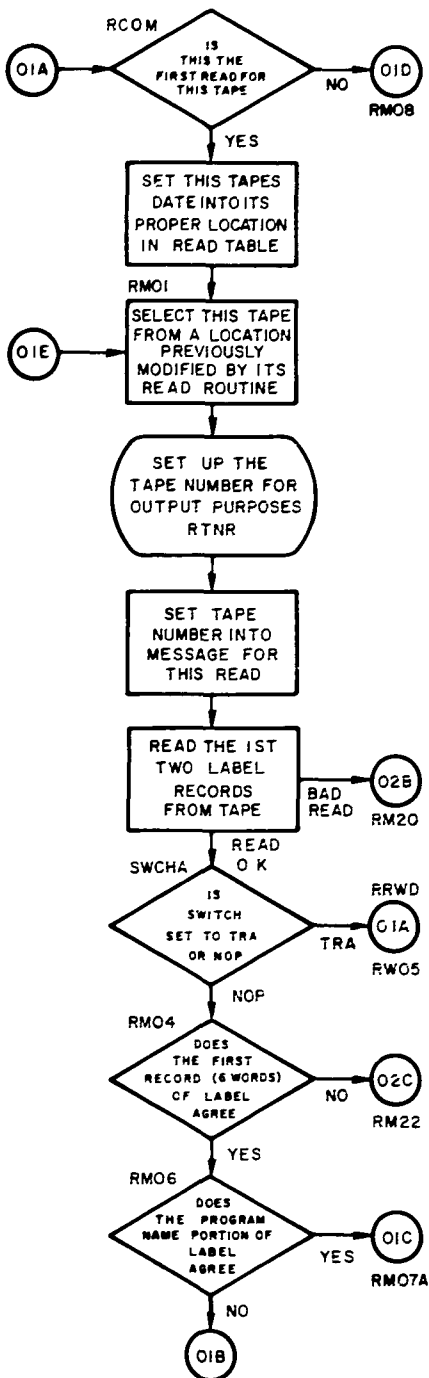
RTNR
TAPSN
READ

EXPLANATION OF CALLING SEQUENCE:

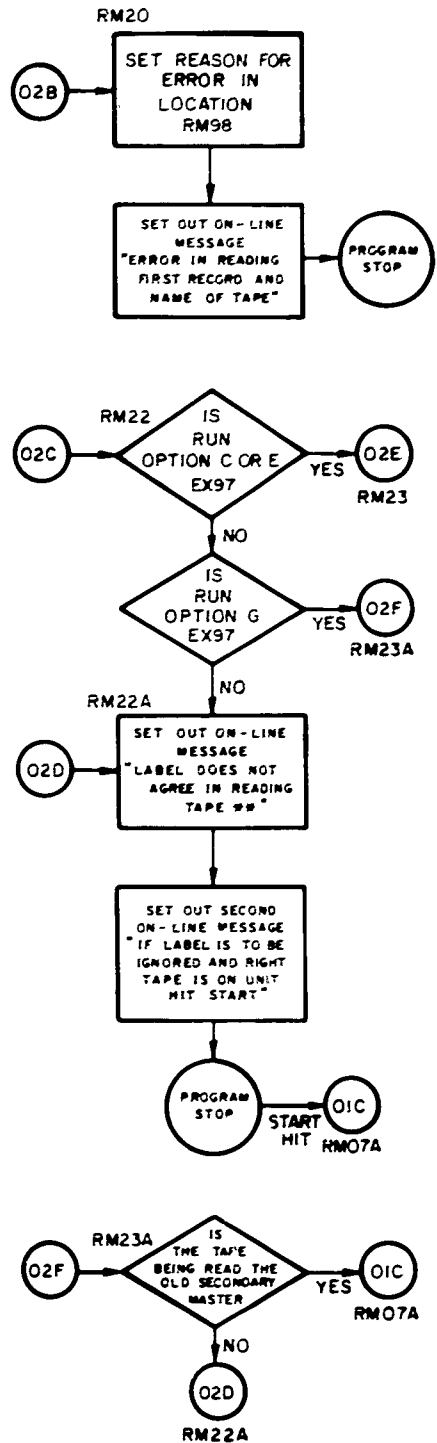
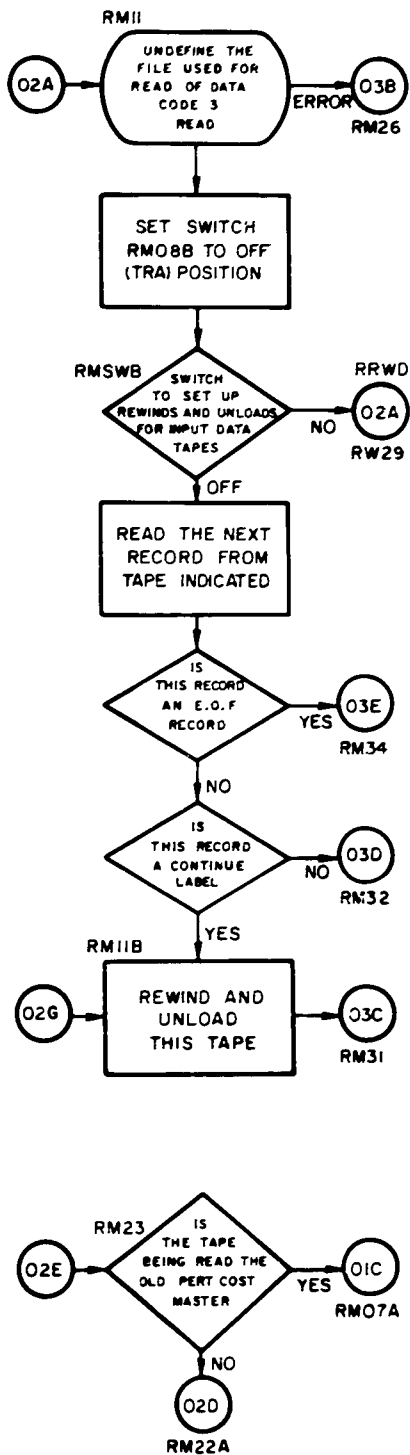
If an error is determined in reading, a message is set out on the on-line printer and the program is stopped. The outlink to this routine is the location set up by the subroutines that use this routine.

REGION RCOM

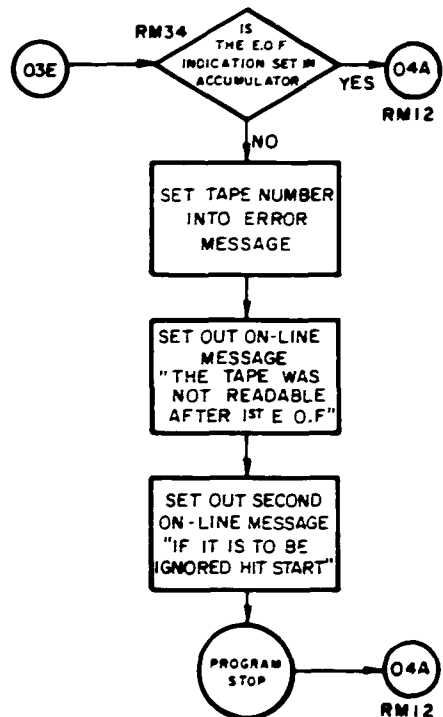
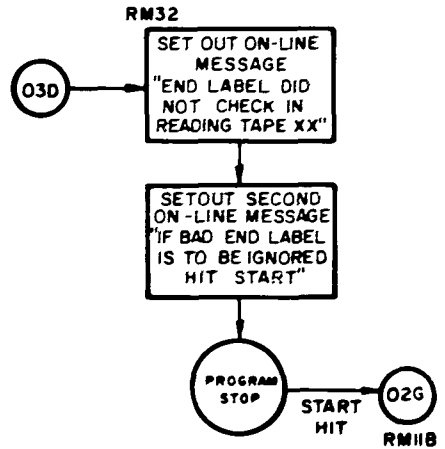
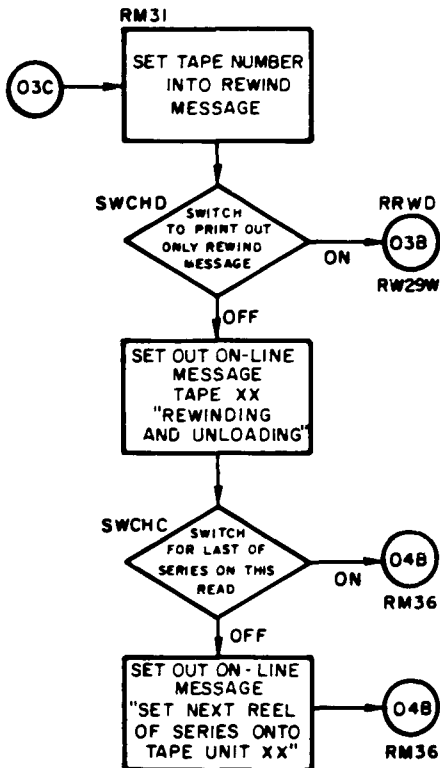
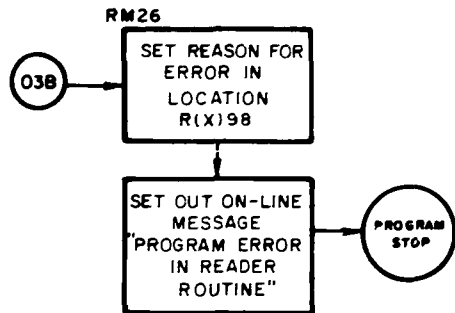
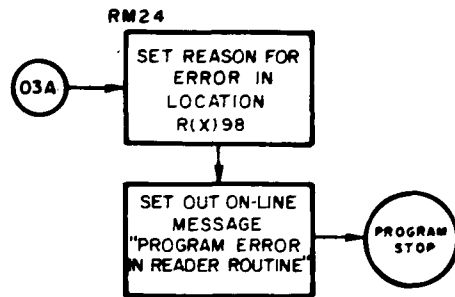
COMMON READ AREA



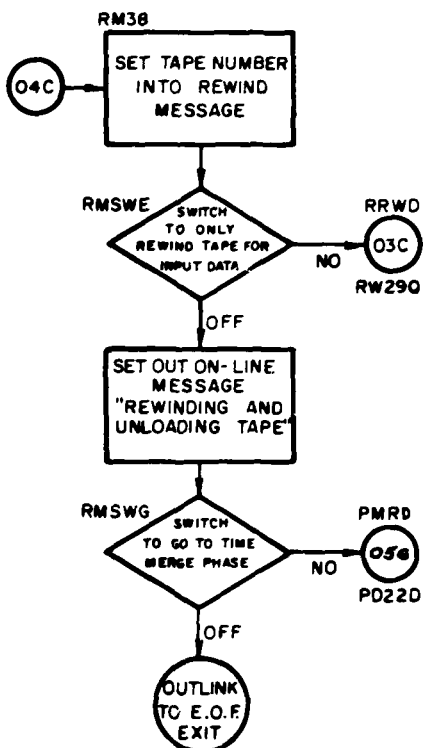
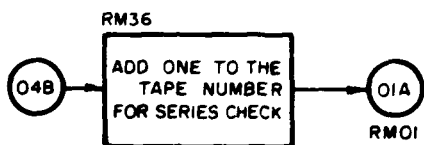
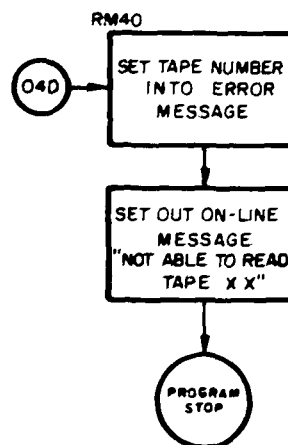
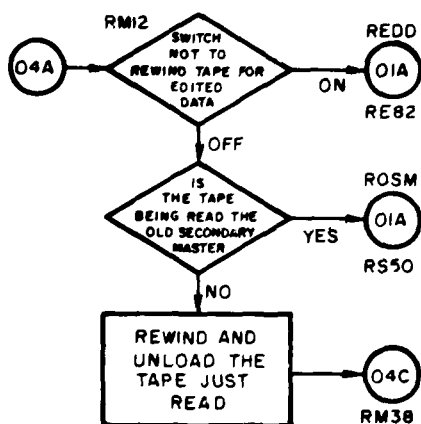
REGION RCOM



REGION RCOM



REGION RCDM



Region RTNR

EXPLANATION OF REGION:

This routine will set up the tape number and beginning read messages.

CALLING SEQUENCE:

L TSX RTNR, 4
L + 1 Normal return

INPUT:

Input is the tape number right-justified in the accumulator

OUTPUT:

Output is the beginning read message on the on-line printer and the set up of tape number into other messages.

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

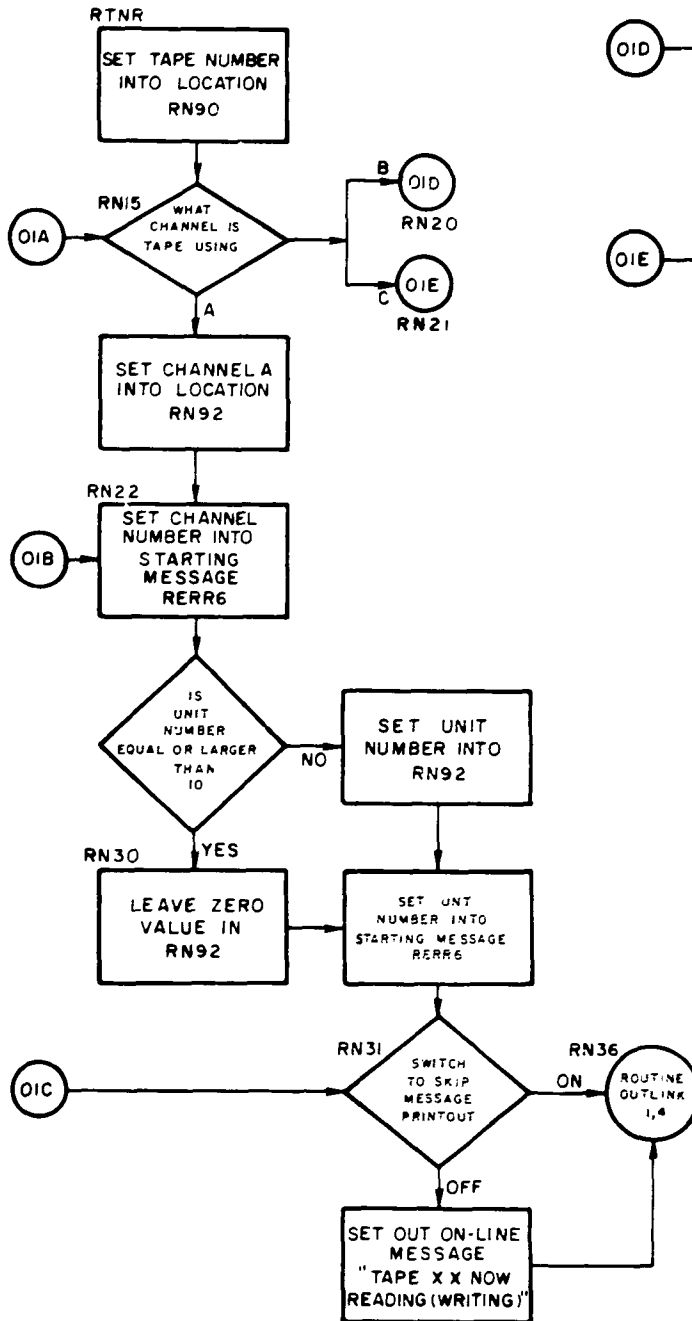
Not applicable

EXPLANATION OF CALLING SEQUENCE:

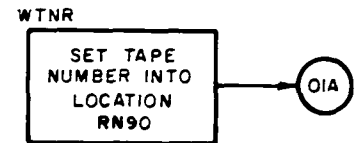
Not applicable

REGION RTNR

SETUP TAPE NUMBER ROUTINE



WTNR
SET UP TAPE
NUMBER
ROUTINE FOR WRITER



Region RINP

EXPLANATION OF REGION:

This routine will read the USERS TIME TAPE input parameters into the system.

CALLING SEQUENCE:

L TSX RINP, 4
L + 1 Normal return

INPUT:

OLD PERT COST MASTER

OUTPUT:

The input parameters will be set into its location in core.

STORAGE USED:

RI25 - RI70 - 21 words

SUBREGIONS AND SUBROUTINES USED:

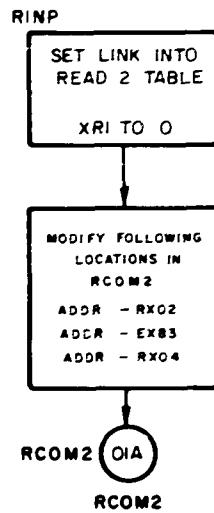
RCOM?

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in reading, a message is set out on the on-line printer and the program is stopped.

REGION RINP

READ INPUT
PARAMETERS



Region RRTB

EXPLANATION OF REGION:

This routine will read the rate table into the system from the OLD PERT COST MASTER.

CALLING SEQUENCE:

L TSX RRTB, 4
L + 1 Normal return

INPUT:

OLD PERT COST MASTER

OUTPUT:

The rate table will be set into its location in core.

STORAGE USED:

RR25 - RR70 - 21 words

SUBREGIONS AND SUBROUTINES USED:

RCOM2

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in reading, a message is set out on the on-line printer and the program is stopped.

REGION RRTB

READRATE
TABLE

RRTB

SET LINK INTO
READ2 TABLE
XRI TO-21

MODIFY FOLLOWING
LOCATIONS IN
RCOM2
ADDR - RX02
ADDR - EX83
ADDR - RX04

RCOM2 (OIA)
RCOM2

Region RSTR

EXPLANATION OF REGION:

From the old PERT COST MASTER, this routine will read into the system the skill table tied to rainbow category and cost category.

CALLING SEQUENCE:

L TSX RSTR, 4
L + 1 Normal return

INPUT:

OLD PERT COST MASTER

OUTPUT:

The skill table will be set into its location in core.

STORAGE USED:

RT25 - RT70 - 21 words

SUBREGIONS AND SUBROUTINES USED:

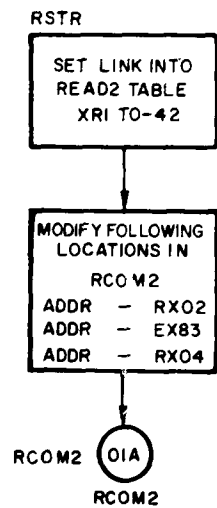
RCOM2

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in reading, a message is set out on the on-line printer and the program is stopped.

REGION RSTR

READ SKILL
TABLE



Region RCOM2

EXPLANATION OF REGION:

This routine will handle the control for the PERT COST TABLES.
It will also produce the error messages and operate the read macros.

CALLING SEQUENCE:

L TRA RCOM2

INPUT:

The following locations are to be modified in the subroutine that uses this routine:

RX09 - Save XR4	RX04 - Location of secondary master
RX02 - Location of tape no.	Date

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

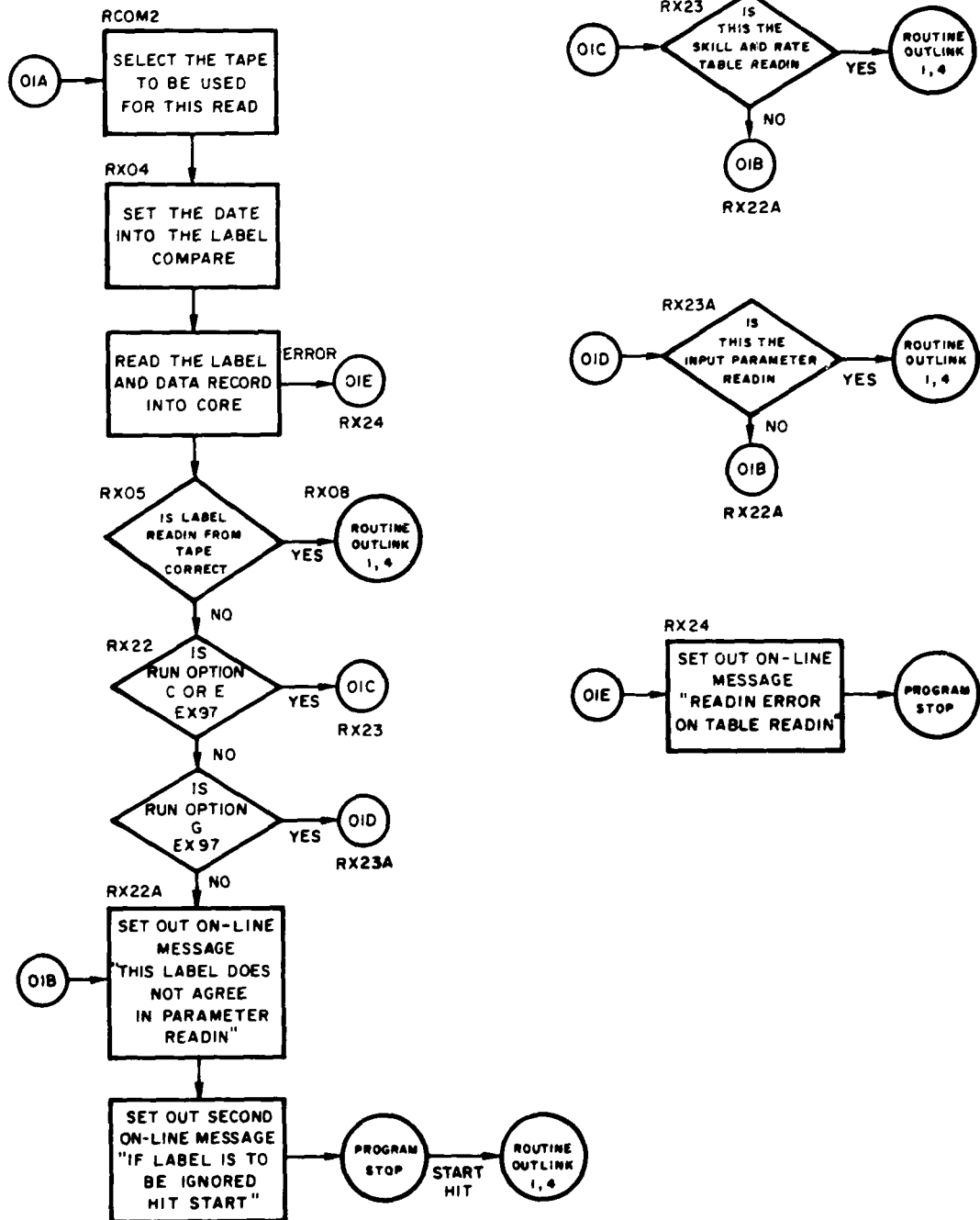
TAPSN (AC)

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in reading, a message is set out on the on-line printer and the program is stopped. The outlink to this routine is the location set up by the subroutines that use this routine.

REGION RCOM2

COMMON READ FOR TABLES



Region WNPM

EXPLANATION OF REGION:

This routine will write the NEW PERT COST MASTER, which is a variable record from a location in core into a blocked record.

CALLING SEQUENCE:

L TSX WNPM, 4
L + 1 Normal return

INPUT:

Location WP91 will contain the location of where the record begins plus the word count.

OUTPUT:

NEW PERT COST MASTER

STORAGE USED:

OPTPE - WP99 - 22 words

SUBREGIONS AND SUBROUTINES USED:

WCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped. If end of tape is reached the program will automatically rewind/unload and continue on after setting on a new tape.

REGION WNPM

WRITE NEW
PERT COST
MASTER TAPE

WNPM

SET INDEX
REGISTERS FOR
WRITE TABLES
XR1 TO 0
XR2 TO 0

MODIFY
FOLLOWING
LOCATIONS IN
WCOM

ADDR - WM08A
DECR - WM08A
ADDR - WM04
DECR - WM04
ADDR - WM03
ADDR - EX83
ADDR - WM54
DECR - WM54

SET UP COUNT
IN LOCATION
WP91

WCOM

01A

WCOM

Region WNSM

EXPLANATION OF REGION:

From a location in core, this routine will write the NEW SECONDARY MASTER, which is a fixed size record, into a blocked record.

CALLING SEQUENCE:

L TSX WNSM, 4
L + 1 Normal return

INPUT:

Not applicable

OUTPUT:

NEW PERT COST MASTER (first file)

STORAGE USED:

OSTPE - WS99 - 22 words

SUBREGIONS AND SUBROUTINES USED:

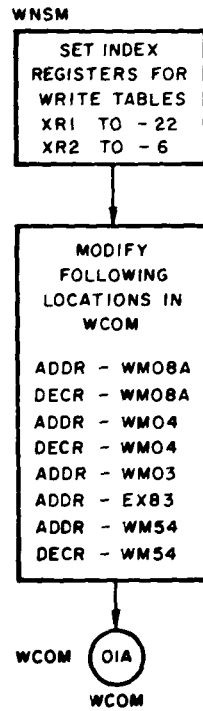
WCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped. If end of tape is reached, the program will automatically rewind/unload and continue on after setting on a new tape.

REGION WNSM

WRITE NEW
SECONDARY
MASTER TAPE



Region WRWD

EXPLANATION OF REGION:

This routine will write the edited data one record at a time onto the EDITED DATA TAPE.

CALLING SEQUENCE:

L TSX WRWD, 4
L + 1 Normal return

INPUT:

Not applicable

OUTPUT:

EDITED DATA TAPE (first file)

STORAGE USED:

EDTPE - WW99 - 22 words

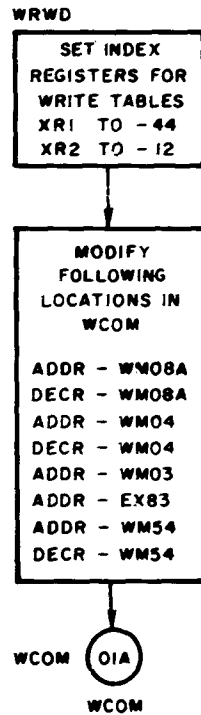
SUBREGIONS AND SUBROUTINES USED:

WCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped. If end of tape is reached, the program will automatically rewind/unload and continue on after setting on a new tape.

WRITE EDITED
DATA TAPE



Region WSTT

EXPLANATION OF REGION:

This routine will write the SORTED TIME TAPE in blocks of 600 words during Option C or E.

CALLING SEQUENCE:

L TSX WSTT, 4
L + 1 Normal return

INPUT:

Not applicable

OUTPUT:

SORTED TIME TAPE (for use in Option G)

STORAGE USED:

SOTPE - WA99 - 22 words

SUBREGIONS AND SUBROUTINES USED:

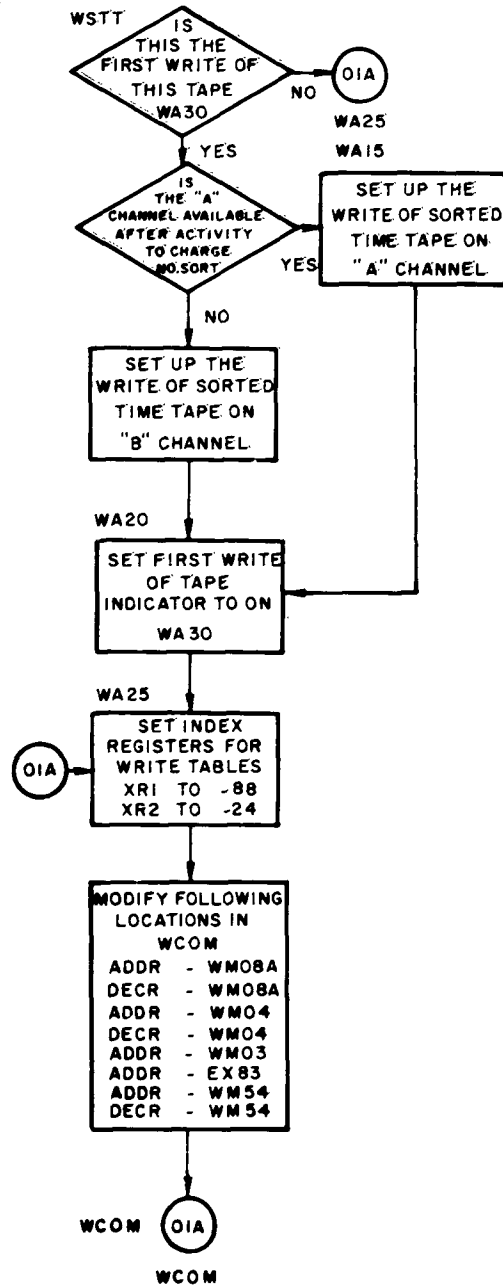
WCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped. If end of tape is reached, the program will automatically rewind/unload and continue on after setting on a new tape.

REGION WSTT

WRITE SORTED
TIME TAPE



Region WCHG

EXPLANATION OF REGION:

This routine will write the SORTED DATA TAPE in blocks of 200 words.

CALLING SEQUENCE:

L TSX WCHG, 4
L + 1 Normal return

INPUT:

Not applicable

OUTPUT:

SORTED DATA TAPE (second file - after EDITED DATA TAPE)

STORAGE USED:

OCTPE - WC99 - 22 words

SUBREGIONS AND SUBROUTINES USED:

WCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped. If end of tape is reached, the program will automatically rewind/unload and continue on after setting on a new tape.

REGION WCHG

WRITE SORTED
DATA TAPE

WCHG

SET INDEX
REGISTERS FOR
WRITE TABLES
XR1 TO -66
XR2 TO -18

MODIFY FOLLOWING
LOCATIONS IN
WCOM

ADDR	-	WM08A
DECR	-	WM08A
ADDR	-	WM04
DECR	-	WM04
ADDR	-	WM03
ADDR	-	EX83
ADDR	-	WM54
DECR	-	WM54

WCOM

OIA

WCOM

Region WCOM

EXPLANATION OF REGION:

This routine will set up all the error messages and operate the write routine for the PERT COST PROGRAM.

CALLING SEQUENCE:

L TRA WCOM

INPUT:

The following locations are to be modified in the subroutine that uses this routine:

WM09	- Save XR1	WM03	- Location of tape no.
WM09A	- Save XR2	WM04	
WM10	- Save XR4	WM08A	} Indirect location of tape no.
WM04	- Decr - Address of location of output buffers	WM54 - Addr	
		WM54 - Decr	

OUTPUT:

The first time this routine is entered for a tape, an on-line message is printed out indicating that the program is writing this tape. All unloads or rewinds are also set out on the printer.

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

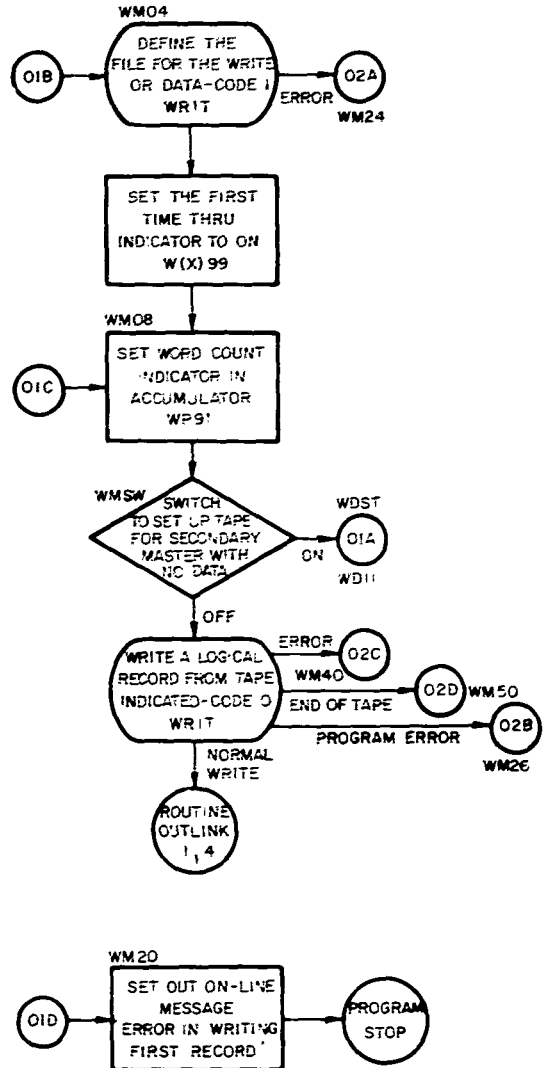
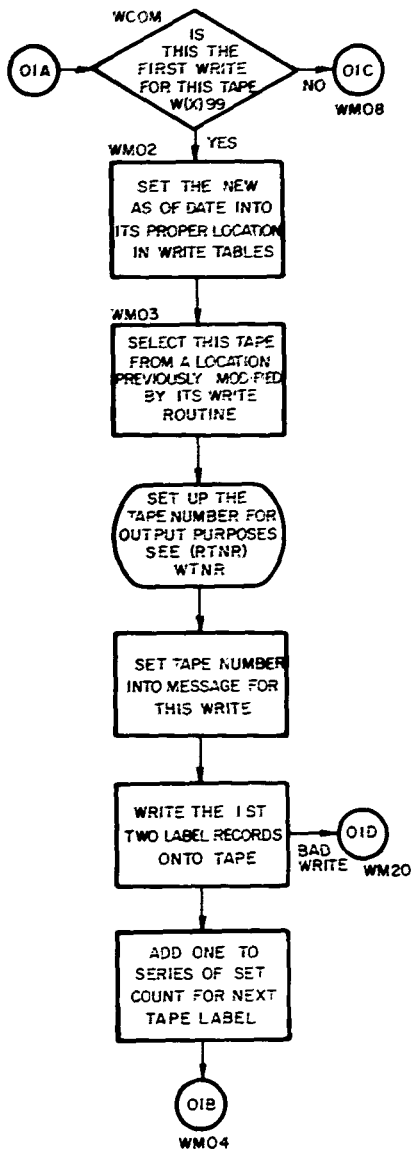
TAPSN
WRIT

EXPLANATION OF CALLING SEQUENCE:

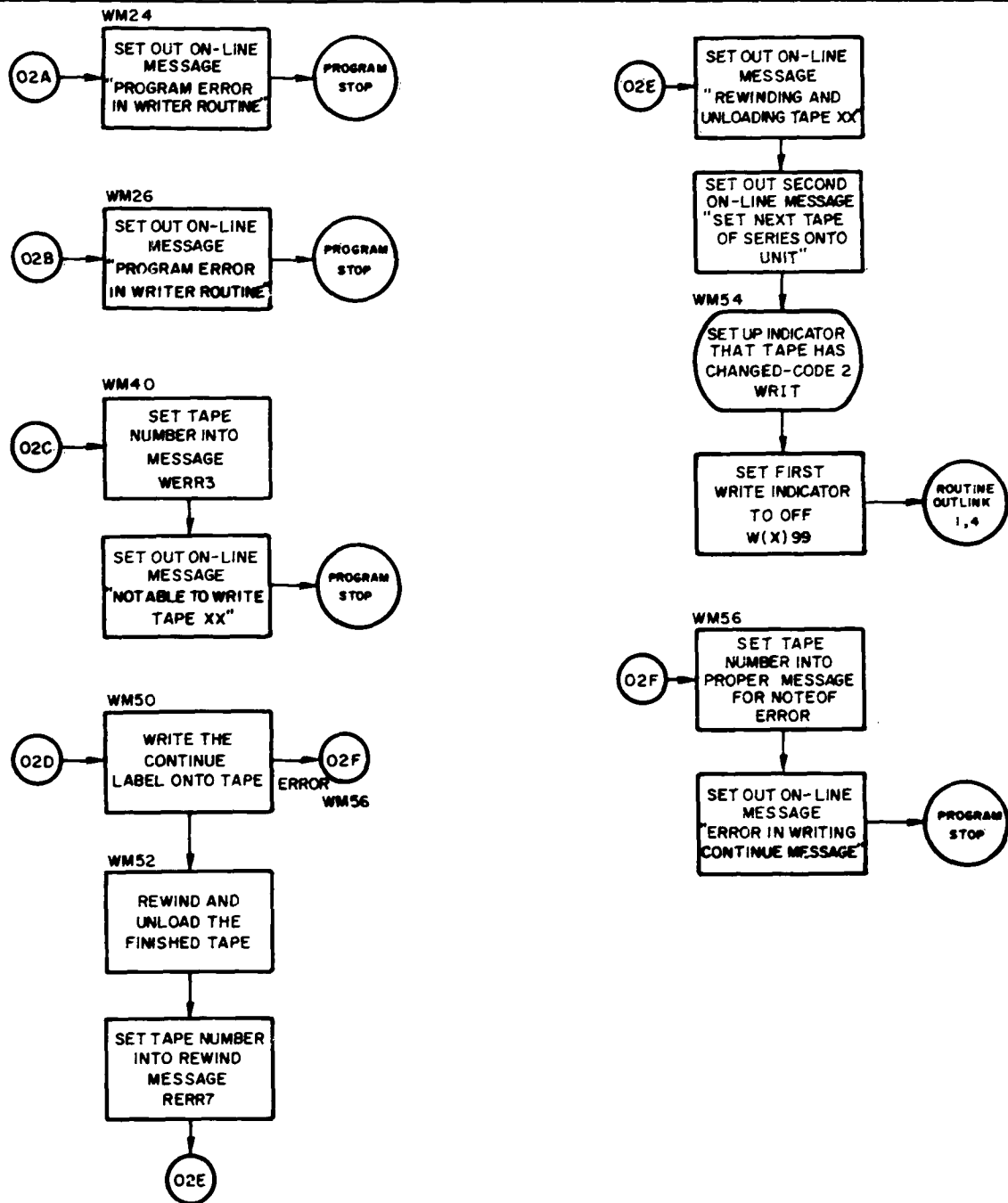
If an error is determined in writing, a message is set out on the on-line printer and the program is stopped. The outlink to this routine is the location set up by the subroutines that use this routine.

REGION WCOM

COMMON WRITE ROUTINE



REGION WCOM



Region WINP

EXPLANATION OF REGION:

This routine will write the USERS TIME TAPE input parameters from core onto tape.

CALLING SEQUENCE:

L TSX WINP, 4
L + 1 Normal return

INPUT:

The input parameters in core

OUTPUT:

NEW PERT COST MASTER (first file)

STORAGE USED:

WI25 - WI30 - 6 words

SUBREGIONS AND SUBROUTINES USED:

WCOM2

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped.

REGION WINP

WRITE INPUT
PARAMETERS

WINP

SET LINK INTO
WRITE2 TABLES
XRI TO 0
XR2 TO 0

MODIFY FOLLOWING
LOCATIONS IN
WCOM2
ADDR - WX02
ADDR - EX83

WCOM2 (01A)
WCOM2

Region WRTB

EXPLANATION OF REGION:

This routine will write the rate table from core onto the NEW PERT COST MASTER.

CALLING SEQUENCE:

L TSX WRTB, 4
L + 1 Normal return

INPUT:

The rate table in core

OUTPUT:

NEW PERT COST MASTER (second file)

STORAGE USED:

WR25 - WR30 - 6 words

SUBREGIONS AND SUBROUTINES USED:

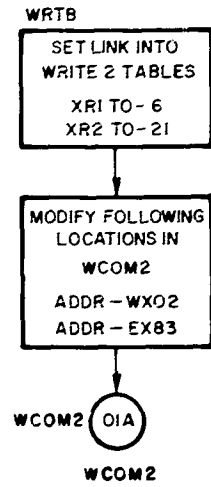
WCOM2

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped.

REGION WRTB

WRITE RATE
TABLE



Region WSTR

EXPLANATION OF REGION:

This routine will write the skill table, tied to rainbow category and cost category, from core onto the NEW PERT COST MASTER.

CALLING SEQUENCE:

L TSX WSTR, 4
L + 1 Normal return

INPUT:

The skill table in core

OUTPUT:

NEW PERT COST MASTER (second file)

STORAGE USED:

WT25 - WT30 - 6 words

SUBREGIONS AND SUBROUTINES USED:

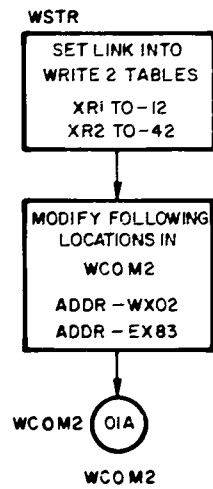
WCOM2

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped.

REGION WSTR

WRITE SKILL
TABLE



Region WCOM2

EXPLANATION OF REGION:

This routine will write out the tables for the PERT Cost program, according to the modifications set up by the subroutines that use this routine.

CALLING SEQUENCE:

L TRA WCOM2

INPUT:

The following locations are to be modified in the subroutine that uses this routine:

WX04 - Save XR1

WX02 - Location of tape no.

WX05 - Save XR2

WX06 - Save XR4

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

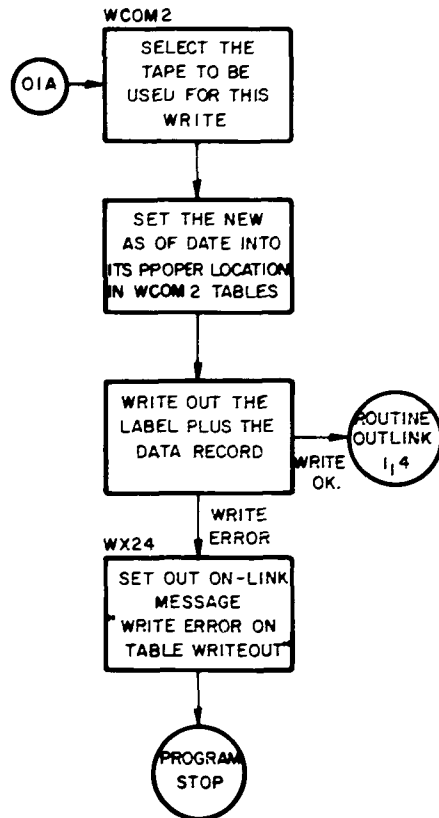
SUBREGIONS AND SUBROUTINES USED:

TAPSN

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in writing, a message is set out on the on-line printer and the program is stopped. The outlink to this routine is the location set up by the subroutines that use this routine.

COMMON WRITE
FOR TABLES



Region WDNP

EXPLANATION OF REGION:

This routine will write the E. O. F. and accomplish the rewind/unloads, for the NEW PERT COST MASTER.

CALLING SEQUENCE:

L TSX WDNP, 4
L + 1 Normal return

INPUT:

Not applicable

OUTPUT:

A completed NEW PERT COST MASTER TAPE rewind and unloaded
(second file)

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

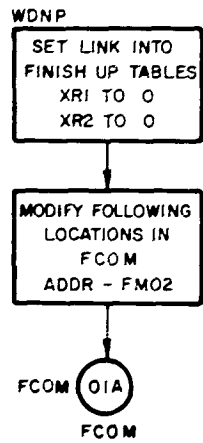
FCOM

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in finishing up this tape, a message is set out on the on-line printer and the program is stopped.

REGION WDNP

FINISH UP
PERT COST TAPE



Region WDNS

EXPLANATION OF REGION:

This routine will write the E. O. F. for the NEW SECONDARY MASTER TAPE.

CALLING SEQUENCE:

L TSX WDNS, 4
L + 1 Normal return

INPUT:

Not applicable

OUTPUT:

A completed NEW SECONDARY MASTER TAPE (first file of the
NEW PERT COST MASTER TAPE)

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

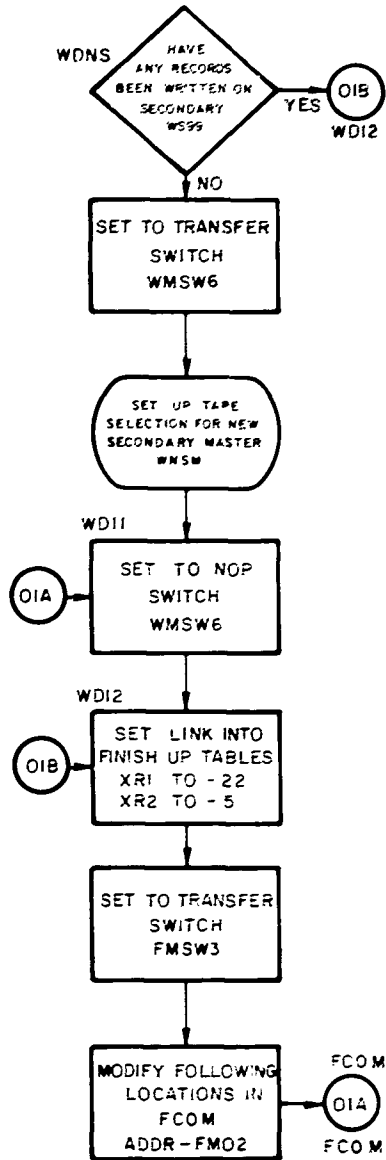
FCOM (AB)

EXPLANATION OF CALLING SEQUENCE:

If an error is determined in finishing up this tape, a message is set
out on the on-line printer and the program is stopped

REGION WDNS

FINISH UP
SECONDARY TAPE



Region WDNE

EXPLANATION OF REGION:

This routine will accomplish the finishing activities for the EDITED DATA TAPE.

CALLING SEQUENCE:

L TSX WDNE, 4
L + 1 Normal return

INPUT:

Not applicable

OUTPUT:

A completed EDITED DATA TAPE (first file, prior to SORTED DATA TAPE)

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

FCOM

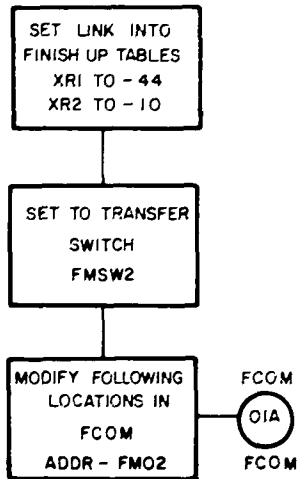
EXPLANATION OF CALLING SEQUENCE:

If an error is determined in finishing up this tape, a message is set out on the on-line printer and the program is stopped

REGION WONE

FINISH UP
EDITED TAPE

WONE



Region WDST

EXPLANATION OF REGION:

This routine will accomplish the finishing activities for the SORTED DATA TAPE.

CALLING SEQUENCE:

L TSX WDST, 4
L + 1 Normal return

INPUT:

Not applicable

OUTPUT:

A completed SORTED DATA TAPE (second file, following EDITED DATA TAPE)

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

FCOM

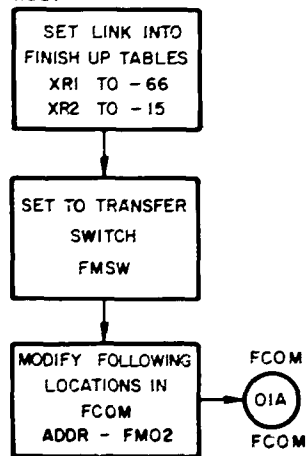
EXPLANATION OF CALLING SEQUENCE:

If an error is determined in finishing up this tape, a message is set out on the on-line printer and the program is stopped.

REGION WDS

FINISH UP SORTED
DATA TAPE

WDS



Region WDTT

EXPLANATION OF REGION:

This routine will accomplish the finishing activities for the SORTED TIME TAPE in Options C or E.

CALLING SEQUENCE:

L TSX WDTT, 4
L + 1 Normal return

INPUT:

Not applicable

OUTPUT:

A completed SORTED TIME TAPE to be used for Option G

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

FCOM

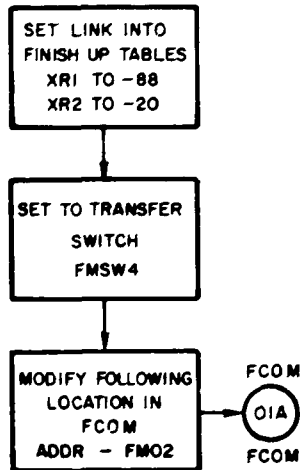
EXPLANATION OF CALLING SEQUENCE:

If an error is determined in finishing up this tape, a message is set out on the on-line printer and the program is stopped.

REGION WDTT

FINISH UP SORTED
TIME TAPE

WDTT



Region FCOM

EXPLANATION OF REGION:

This routine is the common routine for all finish-up subroutines.
This routine will write the ending E. O. F. and rewind and unload
according to the option requested.

CALLING SEQUENCE:

L TRA FCOM

INPUT:

The following locations are modified by the subroutines that use this
routine:

FM07 - Save XR1

FM02 - Indirect location of tape no.

FM08 - Save XR2

FM09 - Save XR4

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

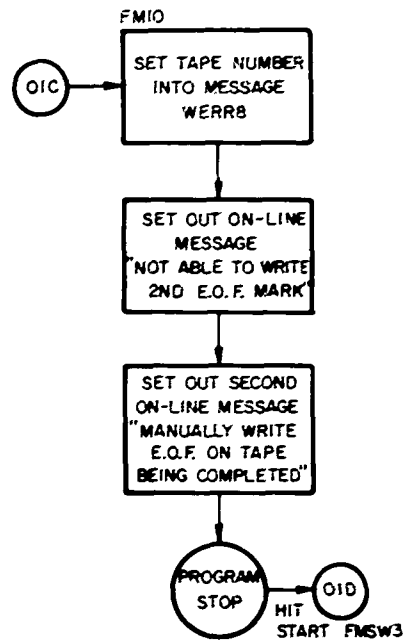
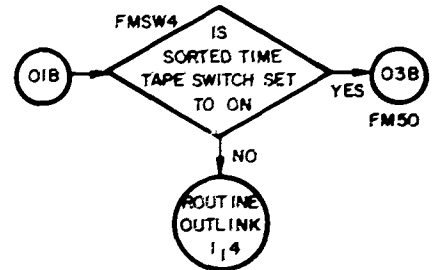
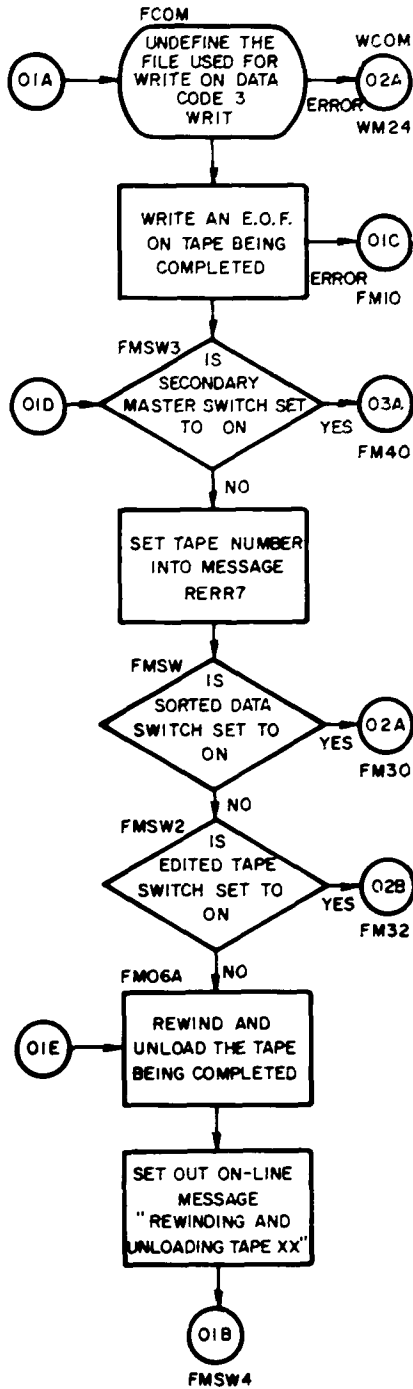
WRIT

EXPLANATION OF CALLING SEQUENCE:

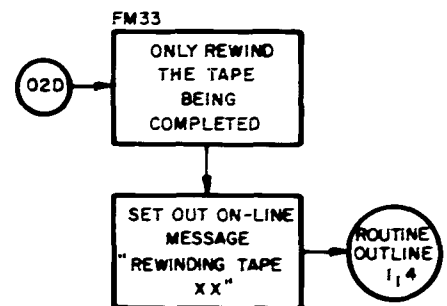
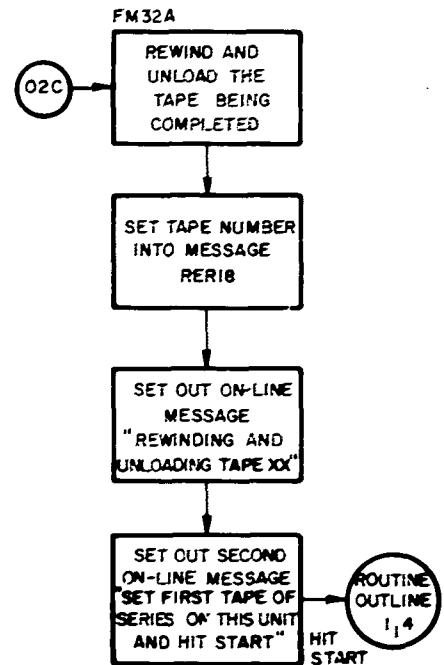
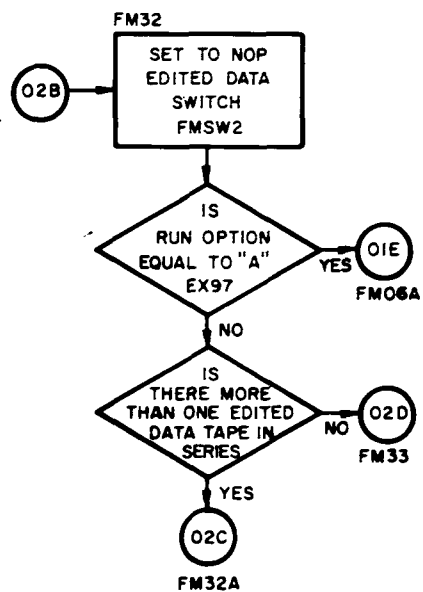
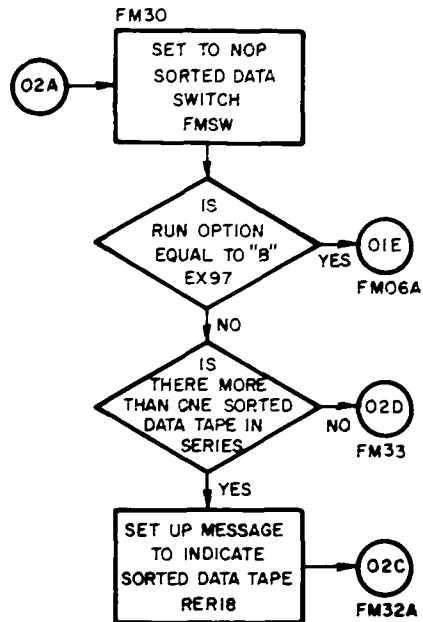
If an error is determined in writing, a message is set out on the
on-line printer and the program is stopped. The outlink to this
routine is the location set up by the subroutines that use this routine.

REGION FCOM

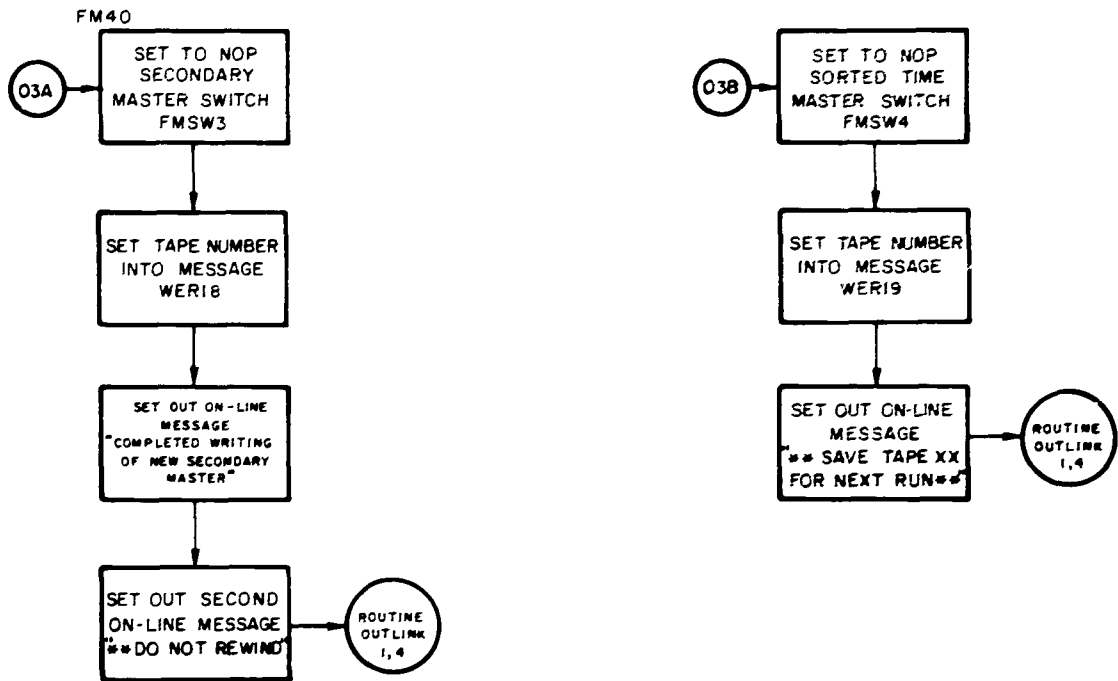
COMMON WRITE
FINISHUP ROUTINE



REGION FCOM



REGION FCOM



Region TAPSN

EXPLANATION OF REGION:

This routine will select the tapes and set the indicated density.

CALLING SEQUENCE:

L	TSX	TAPSN, 4
L + 1	PZE	A
L + 2		Normal return

INPUT:

Not applicable.

OUTPUT:

The tape number in the address of the accumulator in the form of XN.

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

A is the location of a word of the following format:

PZE T, I

where T is the physical tape address and I is the indicated density.

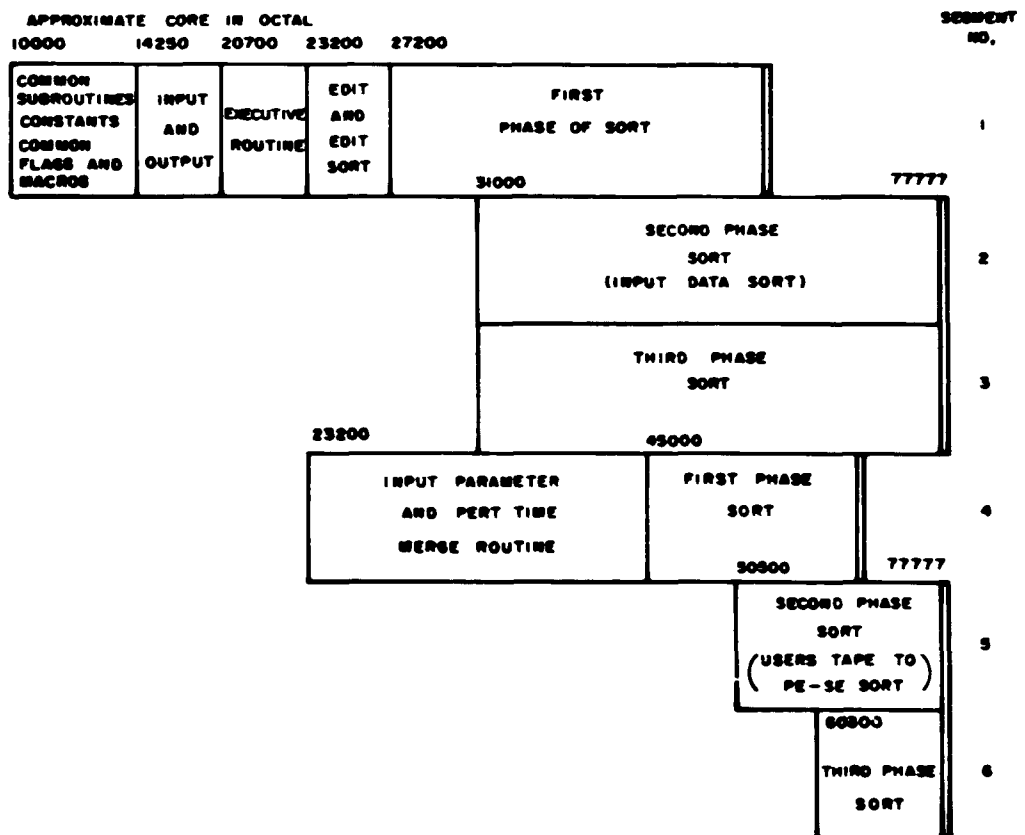
III-C PERT COST EXECUTIVE

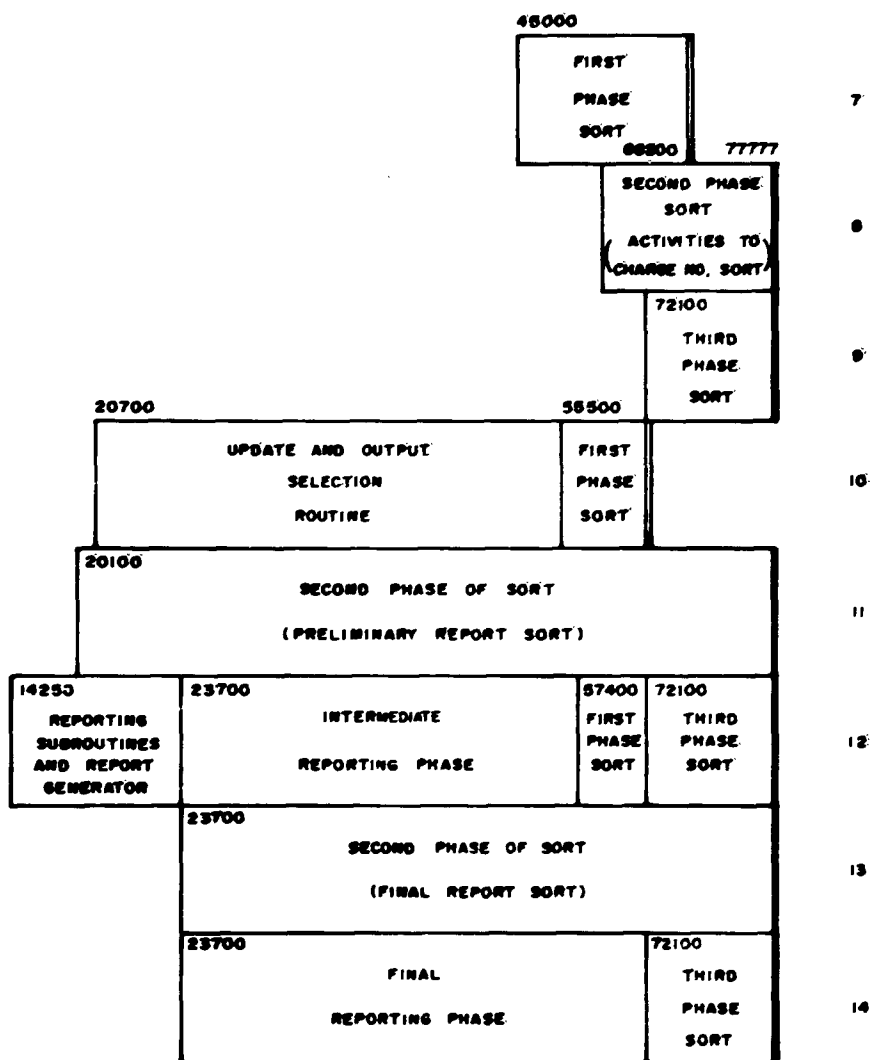
The executive routine will control the loading of the program segments into core, plus the editing of the program control cards. All option control and checks are developed in this routine as well as the initial tape rewinds at program start.

Program Segmentation

The program can be broken down into five basic segments, excluding the sorts, of which each segment itemized below will overlay core area used by the previous segment. The option used will dictate which segments will go into core or be bypassed. Discussed below are each option and the segments used, including the output phase which is not controlled by the executive routine.

a. The Complete Program Segmentation





b. Option A Program Segment Usage

Only segment number 1 is brought into core.

c. Option B Program Segment Usage

Segment 1 is first brought into core. After completion of the edit phase, segment 2 is brought in to sort the input data in the required sequence. At the last pass of the sort, segment 3 is moved into its core location to pull in the sorted information and create the SORTED DATA TAPE.

d. Option C Program Segment Usage

The Option B program segment usage will also hold true for this option. After the creation of the SORTED DATA TAPE, segment 4 is brought in. If it is requested that the USERS TIME TAPE be sorted, segments 5 and 6 are moved in, after which a PSEUDO USERS TIME TAPE is created and segment 7 is moved in. If the USERS TIME TAPE does not have to be sorted, segments 5 and 6 are bypassed and segment 7 is brought in. After completion of the merge phase, segment 8 is brought in to sort the activities into charge number sequence. At the last pass of the sort, segment 9 is moved into its core location to pull in the sorted information and create the SORTED TIME TAPE. (For Option C, segment 10 is brought in to pick up certain information from the OLD PERT COST MASTER TAPE and to duplicate it onto the NEW PERT COST MASTER TAPE. In this option, segment 10 does no updating.) After completing this phase, segment 11 is brought in to sort the WORK PACKAGE/ACTIVITY REPORT (which is the only output from this option) into its proper order. At the last pass of the sort, segment 12 is moved into its core location to create the report and set it out on the OUTPUT REPORT TAPE.

e. Option D Program Segment Usage

The Option B program segment usage will also hold true for this option. After the creation of the SORTED DATA TAPE, segment 4 is brought in. If it is requested that the USERS TIME TAPE be sorted, segments 5 and 6 are moved in, after which a PSEUDO USERS TIME TAPE is created and segment 7 is moved in. If the USERS TIME TAPE does not have to be sorted, segments 5 and 6 are bypassed and segment 7 is moved in. After completion of the merge phase, segment 8 is brought in to sort the activities into charge number sequence. At the last pass of the sort, segment 9 is moved into its core location. It will pull in the sorted information but will not create a physical SORTED TIME TAPE. At the same time that segment 9 is brought in, segment 10 is moved into core. After completion of the update and report selection routine, segment 11 is brought in to sort the output data. For the WORK PACKAGE/ACTIVITY REPORTS it will be the final sort; for all other reports it will be an intermediate sort. At the last pass of the sort, segment 12 is brought in to manipulate the data and to set

them out for the final sort. After completion of this manipulation, segment 13 is brought in to sort the output data in the required sequence. At the last pass of the sort, segment 14 is moved into its core location to pull in the sorted information and create the reports to be placed on the OUTPUT REPORT TAPE.

f. Option E Program Segment Usage

The Option E program segment usage will read in segment 1, bypass 2 and 3, and move segment 4 into its core location. It will use a SORTED DATA TAPE created in an earlier run. Option E will then follow the exact program segment usage as indicated in Option C.

g. Option F Program Segment Usage

The Option F program segment usage will read in segment 1, bypass 2 and 3, and move segment 4 into its core location. It will use a SORTED DATA TAPE created in an earlier run. Option F will then follow the exact program segment usage as indicated in Option D.

h. Option G Program Segment Usage

The Option B program segment usage will also hold true for this option. After creation of the SORTED DATA TAPE, segment 4 is brought in. The only reason that this segment is used is to duplicate the OLD SECONDARY MASTER TAPE onto the NEW SECONDARY MASTER TAPE. After the duplication effort, segments 5, 6, 7, 8, and 9 are bypassed, and segment 10 is brought into core. This option will use SORTED TIME TAPE created in an earlier run. After segment 10 is brought in, Option G will operate exactly as does Option D.

Control Card Setup

The control cards used with any one run will be set on the INPUT DATA TAPE as the first records following the unsorted data label. Following the control cards will be the raw or edited input data. During the edit phase the control cards will be set onto the EDITED DATA TAPE. If more than one input tape is used the first tape read in will be the one that contains the control cards.

Executive On-Line Messages

At the start of the program, certain information-type messages are set out on the on-line printer. These messages indicate the option selected as well as the reports requested. These messages will take the following forms:

a. Beginning Message

THE PERT - COST PROCESSING RUN OF DDMMYY
FOR - (Program Name)

The date in the beginning message is the NEW MASTER
FILE DATE from the control card, and the program name
is determined from the name in the "A" control card.

b. Option Selected Message

This message will vary, depending on the option selected
by the user.

Option A

THE FOLLOWING PHASE WILL BE OPERATED UPON:

INPUT EDIT

Option B

THE FOLLOWING PHASES WILL BE OPERATED UPON:

INPUT EDIT

INPUT EDIT SORT

Option C

THE FOLLOWING PHASES WILL BE OPERATED UPON:

INPUT EDIT

INPUT EDIT SORT

TIME MERGE AND SORT

Option D

THE FOLLOWING PHASES WILL BE OPERATED UPON:

INPUT EDIT
INPUT EDIT SORT
TIME MERGE AND SORT
COST UPDATE AND REPORTING

Option E

THE FOLLOWING PHASE WILL BE OPERATED UPON:

TIME MERGE AND SORT

Option F

THE FOLLOWING PHASES WILL BE OPERATED UPON:

TIME MERGE AND SORT COST UPDATE AND REPORTING

Option G

THE FOLLOWING PHASES WILL BE OPERATED UPON:

INPUT EDIT
INPUT EDIT SORT
COST UPDATE AND REPORTING

c. Reports Requested Message

The reports selected as indicated on control card B will be listed on the on-line printer. This listing will contain the report name and number, its sort, and level requested, if any. The following is the format of the on-line messages:

THE FOLLOWING REPORTS WILL BE PRODUCED

ERROR LISTINGS

- ```

01 - WORK PACKAGE/ACTIVITY REPORT - RESP, CHGE, PRED, SUCC
02 - WORK PACKAGE/ACTIVITY REPORT - CHGE, PRED, SUCC
10 - ORGANIZATIONAL STATUS REPORT - PERF, CHGE, RESP, RESC
 LEVEL NO. XX
11 - ORGANIZATIONAL STATUS REPORT - RESC, CHGE, RESP, PERF
 LEVEL NO. XX
12 - ORGANIZATIONAL STATUS REPORT - CHGE, RESP, PERF, RESC
 LEVEL NO. XX

```

|                                                                  |              |
|------------------------------------------------------------------|--------------|
| 13 - ORGANIZATIONAL STATUS REPORT - RESP, CHGE, PERF, RESC       | LEVEL NO. XX |
| 20 - ORGANIZATIONAL STATUS REPORT - NETW, PERF, CHGE, RESP, RESC | LEVEL NO. XX |
| 21 - ORGANIZATIONAL STATUS REPORT - NETW, RESC, CHGE, RESP, PERF | LEVEL NO. XX |
| 22 - ORGANIZATIONAL STATUS REPORT - NETW, CHGE, RESP, PERF, RESC | LEVEL NO. XX |
| 23 - ORGANIZATIONAL STATUS REPORT - NETW, RESP, CHGE, PERF, RESC | LEVEL NO. XX |
| 30 - MANAGEMENT SUMMARY REPORT                                   | LEVEL NO. XX |
| 35 - PROGRAM/PROJECT STATUS REPORT                               | LEVEL NO. XX |
| 40 - FINANCIAL PLAN/STATUS REPORT - MNTH, CHGE                   | LEVEL NO. XX |
| 41 - FINANCIAL PLAN/STATUS REPORT - MNTH                         | LEVEL NO. XX |
| 50 - MANPOWER LOADING REPORT - RESC, MNTH, PERF, CHGE            | LEVEL NO. XX |
| 51 - MANPOWER LOADING REPORT - RESC, MNTH                        | LEVEL NO. XX |
| 52 - MANPOWER LOADING REPORT - PERF, MNTH, RESC                  | LEVEL NO. XX |
| 55 - RAINBOW CATEGORY REPORT                                     | LEVEL NO. XX |
| 60 - COST CATEGORY STATUS REPORT                                 | LEVEL NO. XX |
| 70 - SUMMARY FINANCIAL FORECAST - SUMMARY ITEM - YEAR            | LEVEL NO. XX |
| 71 - SUMMARY FINANCIAL FORECAST - COST CATEGORY - YEAR           | LEVEL NO. XX |
| 75 - SUMMARY FINANCIAL FORECAST - SUMMARY ITEM - MNTH            | LEVEL NO. XX |
| 76 - SUMMARY FINANCIAL FORECAST - COST CATEGORY - MNTH           | LEVEL NO. XX |
| 80 - BUDGET AUTHORIZATION AND UPDATING FORM                      | LEVEL NO. XX |
| 85 - ESTIMATING AND UPDATING FORM                                | LEVEL NO. XX |

For the above messages, the first two lines will come out on all on-line listings. For Options C and E, the program will automatically set out report type 01 and its accompanying message. On Options D, F, and G, one or more of the messages will be set out, dependent on what reports have been selected.

The XX following the LEVEL NO. will indicate the level that has been requested for a particular report. Each level will be another line with the level number indicated in the message. If the level number is above 16, the following message will be put out on the on-line printer:

LEVEL OVER 16 INDICATED WILL BE SET TO 16

If the report number requested is not a legal number, the following message will be put out on the on-line printer, with the XX indicating the illegal number:

UNAUTHORIZED REPORT NO. XX

d. End-of-Phase Messages

At the end of each major phase, a message will be forthcoming indicating the completion of one phase and the entrance into the next phase. These messages will take the following forms, depending on the phase being completed:

1. END OF PERT EDIT PHASE
2. END OF PERT COST EDIT SORT PHASE
3. END OF PERT COST TIME MERGE PHASE
4. END OF PERT COST UPDATE PHASE
5. END OF PERT COST PROCESSING RUN

If at the completion of a particular phase, the program is to finish without entering another phase, the message, END OF PERT COST PROCESSING RUN, will supersede the normal end-of-phase message.

Executive Control Card Error Messages

The executive routine will accomplish the editing of the program control cards. Any error that is determined during this edit operation will have an accompanying message indicating the problem set out on the on-line printer. If any errors are determined, the system will stop at completion of the control card edit. These error messages will take the following form:

- a. THE-A-CARD IS NOT THE FIRST CONTROL CARD IN THE SYSTEM

The first control card read by the executive program is not an "A" card.

- b. A DATE ON THE CONTROL CARD HAS NON-NUMERIC CHARACTERS IN THE DD OR YY

One of the "A" control card dates has a non-numeric day or year in the field.

- c. CANNOT LOCATE A MONTH INDICATED ON CONTROL CARD DATE

One of the "A" control card dates has an illegitimate month in its field.

- d. THE DAYS DO NOT FALL IN THE RANGE SPECIFIED BY THE MONTH

The number of days associated with a particular month does not fall in the range specified for that month.

- e. THERE IS NO OPTION CODE IN CONTROL CARD A

The column to indicate option code is blank or zero in control card "A"

- f. THE OPTION CODE IS INCORRECT

The option code in control card "A" is not in the range of A to G

- g. THERE IS NO AS OF DATE IN CONTROL CARD A

The new master file date in control card "A" columns 12 through 18 is blank or zero.

- h. ONE OF THE DATES REQUIRED FOR OPERATION IS NOT INCLUDED IN CONTROL CARD A

Dependent upon the option requested, certain dates have to be present in the "A" control card. These options and dates are:

1. Option A - New Master File Date
2. Option B - New Master File Date
3. Option C - New Master File Date  
Report Issue Date  
PERT Time Tape Date  
Secondary Master Date

4. Option D - New Master File Date  
Report Issue Date  
PERT Time Tape Date  
Secondary Master Date  
PERT Cost Master Date
  5. Option E - Same as Option C
  6. Option F - Same as Option D
  7. Option G - New Master File Date  
Report Issue Date  
PERT Time Tape Date  
PERT Cost Master Date
- i. DUPLICATE A CARDS FOR THIS RUN  
  
More than one "A" card is present in the control card deck.
  - j. INPUT TAPE COUNT INCORRECT  
  
The column indicating input tape count in control card "A" is not in the range of 1 to 9.
  - k. NO INPUT TAPES INDICATED ON OPTIONS REQUIRED  
  
For options A, B, C, D, and G the input tape count in control card "A" is zero or blank.
  - l. ALPHABETIC CHARACTERS IN MAN-MONTH CONVERSION FIELD  
  
The value in the man-month conversion field is non-numeric.
  - m. THE CONTROL CARD CODE IS INCORRECT  
  
The control card code in column 1 is not in the range of A to F.
  - n. THERE IS NO CONTROL CARD CODE  
  
The control card code in column 1 is a blank or zero.
  - o. MORE THAN 5 OUTPUT REPORT CONTROL CARDS INSERTED  
  
The limit of 5 cards with a code of B has been surpassed.

p. **NO REPORTS INDICATED ON OPTIONS REQUIRING REPORTS**

There is no "B" control card on options D, F, or G which are required to produce at least one output report other than the error listing.

q. **MORE THAN 50 PROJECT CONTROL CARDS INSERTED**

The limit of 50 network or project cards with a code of "C" has been surpassed.

r. **DUPLICATE D CARDS FOR THIS RUN**

More than one "D" card is present in the control card deck.

s. **TAPE CHANNEL NOT A-B-C**

On the "D" control card, one of the tape reassignments is using a channel other than A-B-C.

t. **DUPLICATE E CARDS FOR THIS RUN**

More than one "E" card is present in the control card deck.

u. **DUPLICATE F CARDS FOR THIS RUN**

More than one "F" card is present in the control card deck.

v. **SECURITY NO. INCREMENTER NOT IN RANGE**

The field that indicates the character of the security number to increment is not in the range of 0-24.

**Executive Program Operations**

The following are some of the conventions used in the executive phase:

a. **Executive Flag Indications**

During the executive phase, many flags are set which are used during future phase processing. These flags are:

**EX81 - If option C or E is in effect, this flag is set on**

- EX84 - If file establishment on PERT COST MASTER TAPE is indicated, this flag is set on
- EX85 - If file establishment on SECONDARY MASTER TAPE is indicated, this flag is set on
- EX86 - If the time tape is in SE-PE sequence, this flag is set on
- EX87 - If an "F" control card is present, this flag is set on
- EX88 - If an "E" control card is present, this flag is set on
- EX89 - This flag will carry the count of the input tapes involved in this run
- EX90 - If a "D" control card is present, this flag is set on
- EX91 - If a "B" control card is present, this flag is set on
- EX92 - This flag will carry the count of the "B" control cards present in this run
- EX93 - This flag will carry the count of the "C" control cards present in this run
- EX94 - If there is no secondary master date, this flag is set on
- EX95 - If there is no PERT Cost master date, this flag is set on
- EX96 - If there is no user's time tape date, this flag is set on
- EX97 - The option being requested is carried in this flag as a value of 1 through 7, representing A thru G, respectively
- EX98 - If there is no report issue date, this flag is set on



EX99 - If an "A" control card is present, this flag is set on

EX99A - If this run is to be made without any time input, this flag is set on

When a flag is considered "on," it means a nonzero value is placed in that flag.

b. Tape Table

A special tape table has been constructed for this program to give it a greater flexibility with a minimum control card manipulation. This table will be preset to the following conditions:

|                                   |    |
|-----------------------------------|----|
| 1. USER'S TIME TAPE               | B4 |
| 2. SORTED DATA TAPE               | B5 |
| 3. OLD PERT COST MASTER           | B6 |
| 4. SORT - MERGE TAPE              | B2 |
| 5. SORT - MERGE TAPE              | B1 |
| 6. SYSTEM ERROR AND OUTPUT TAPE   | A2 |
| 7. INPUT AND NEW PERT COST MASTER | A6 |
| 8. INPUT AND SORT-MERGE TAPE      | A7 |
| 9. SORT - MERGE TAPE              | A4 |

If this arrangement differs from the tape setup at a particular installation, it can be changed with the use of the "D" control card. Both the tape setup and density can be set with this card. All the above tapes are set to high density in the tape table.

Channel A, B, or C with any unit number from 0 to 9 can be used in this table.

### Executive Region Descriptions

The region descriptions on the following pages will describe the major subroutines used in the executive region as well as the executive routine itself. Behind each region description will be one or more flow charts describing that region. Figure III-C-1 is the control card layout.

[illegible]

Fig. III-C-1 Control Card

## Region EXEC

### EXPLANATION OF REGION:

This routine will edit and decipher the control cards. It will control the phasing of the program segments, as well as set up all of the option conditions. All tapes to be used will be initially rewound in this region.

### CALLING SEQUENCE:

Program will initially transfer to the EXEC portion of the system. All links to the other phases will be made in this section.

### INPUT:

Control cards

### OUTPUT:

Not applicable

### STORAGE USED:

SCHLD - 4 words - Security number hold  
PNHLD - 4 words - Program name hold (new or current)  
PNHD2 - 4 words - Program, name hold (old)  
TRMSP - 3 words - Term (span)  
ORHLD - 70 words - Output report selections hold  
PJHLD - 50 words - Project number hold

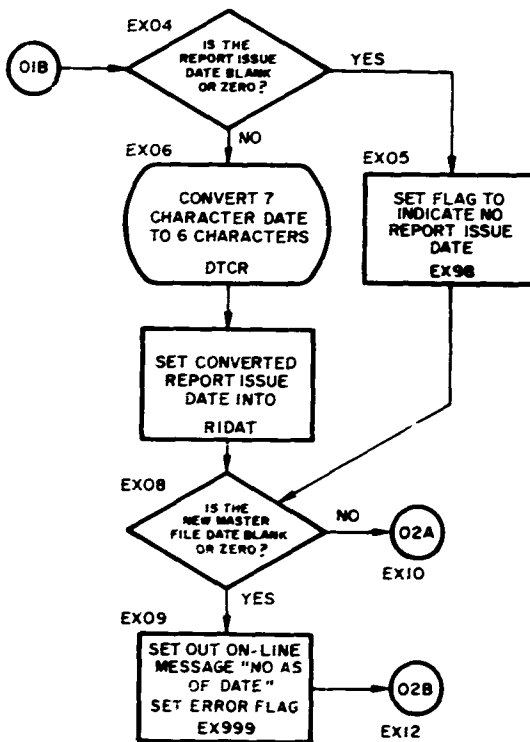
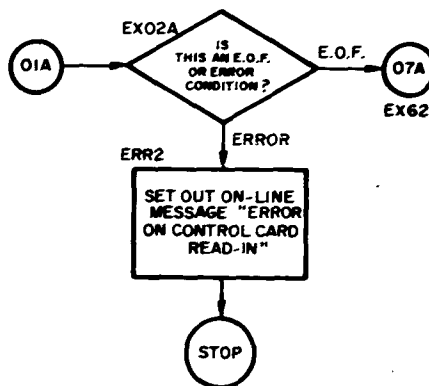
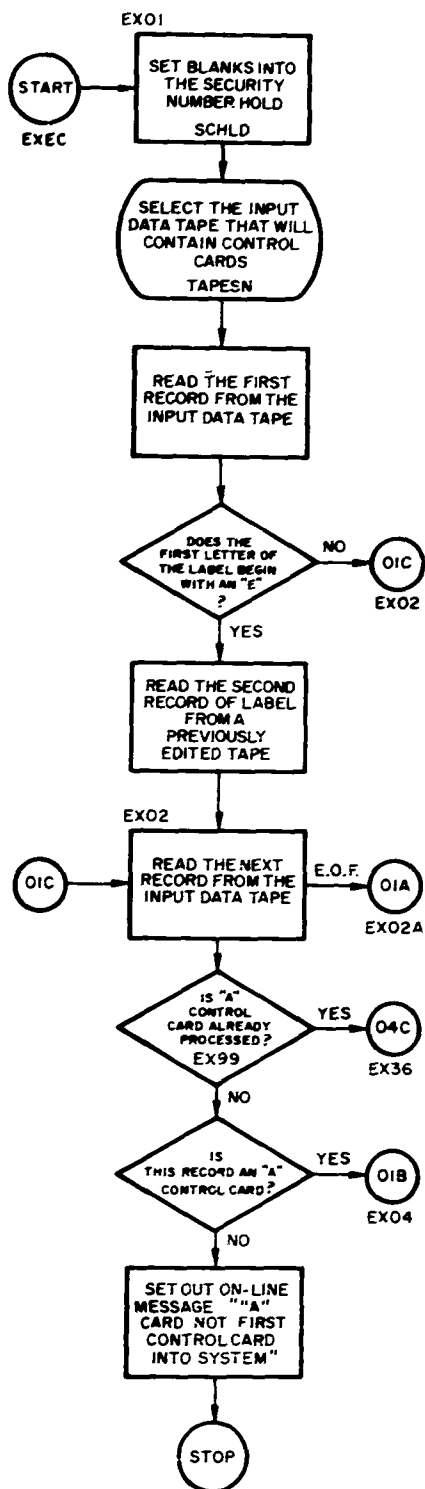
### SUBREGIONS AND SUBROUTINES USED:

|       |       |
|-------|-------|
| DTCR  | PMAS  |
| FIXPT | PUAOT |
| TUASN | MSRT  |
| EDIT  | JAOO  |
| EDSO  |       |

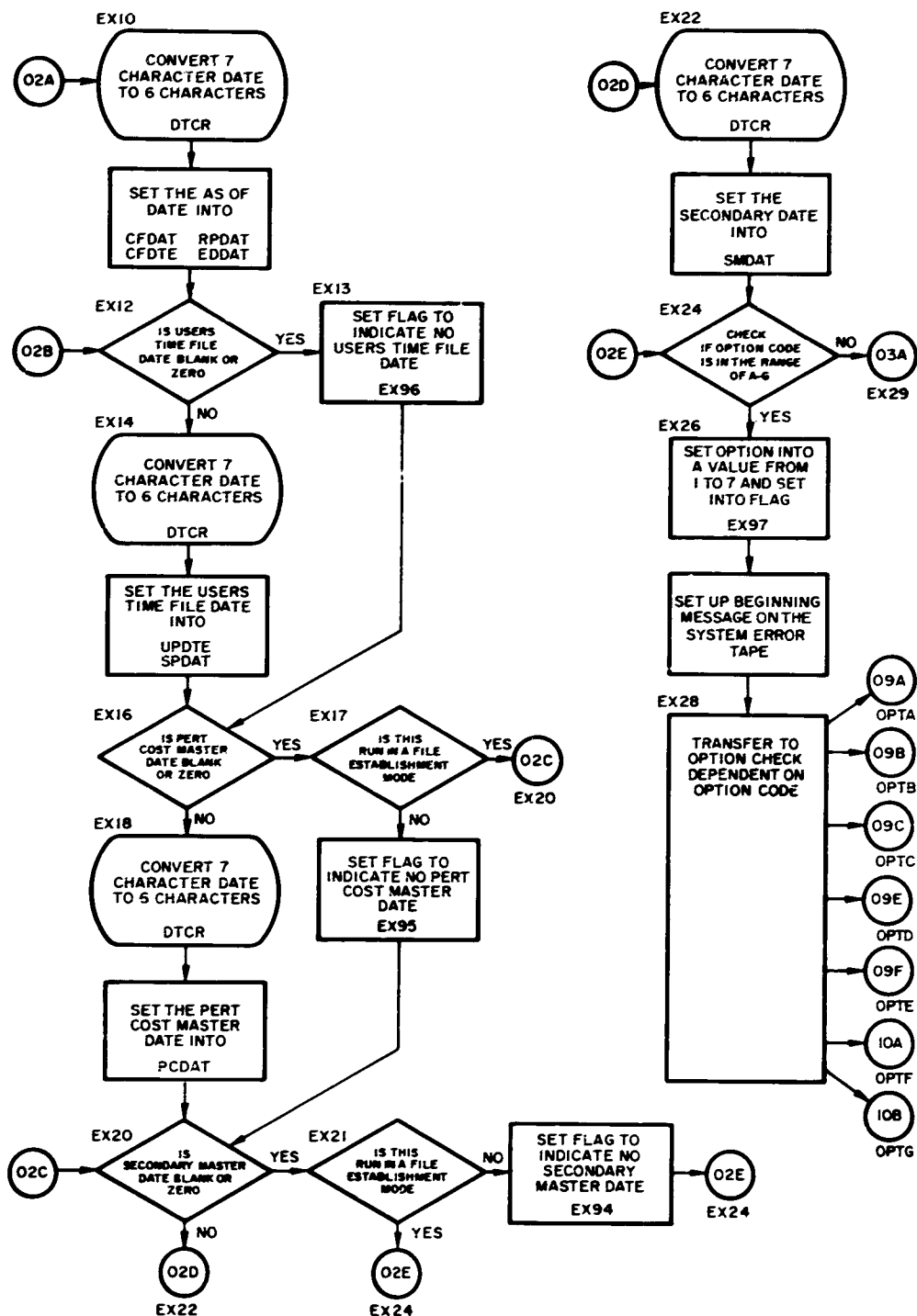
### EXPLANATION OF CALLING SEQUENCE:

Not applicable

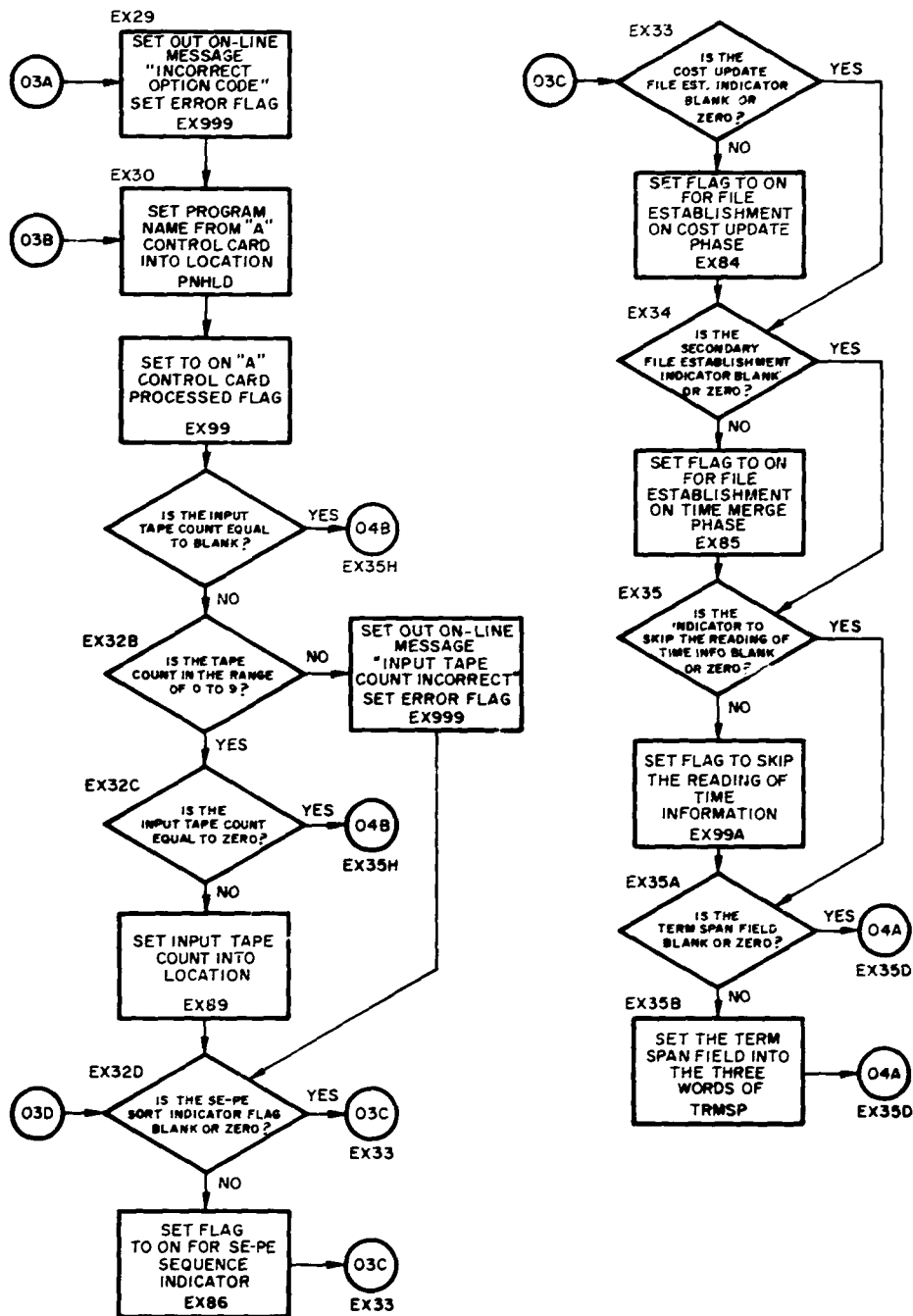
# REGION EXECUTIVE



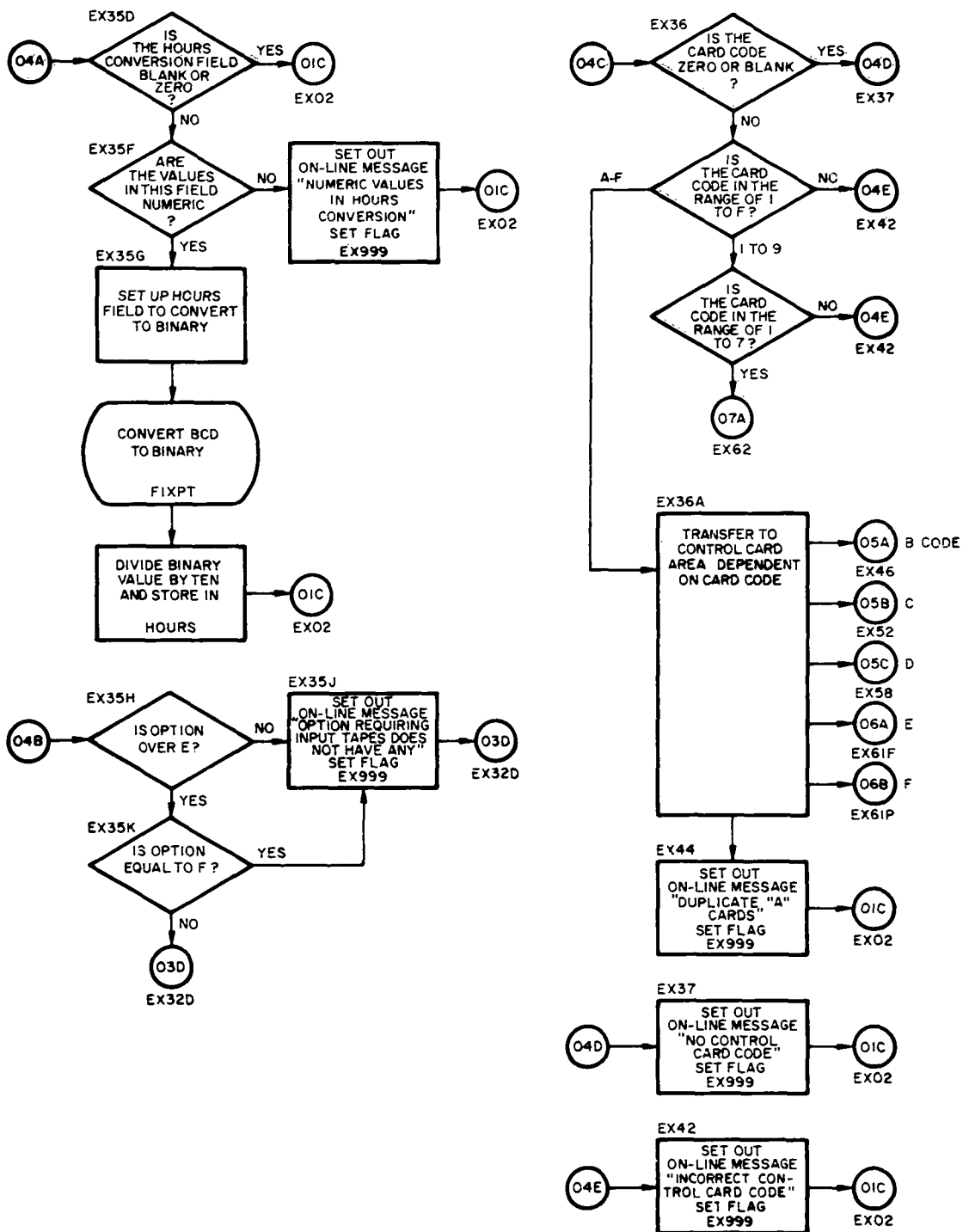
# REGION EXECUTIVE



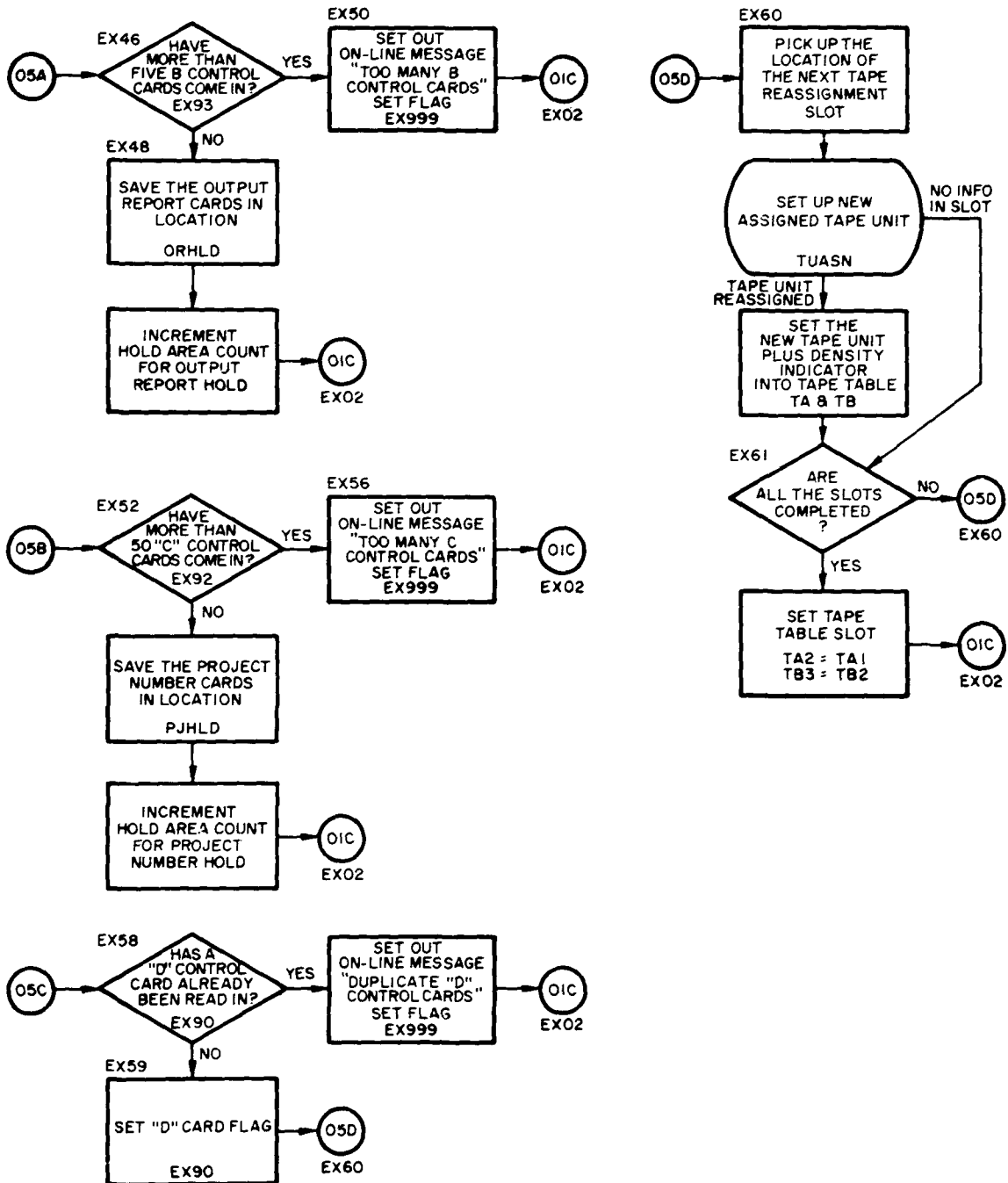
REGION EXECUTIVE



REGION EXECUTIVE

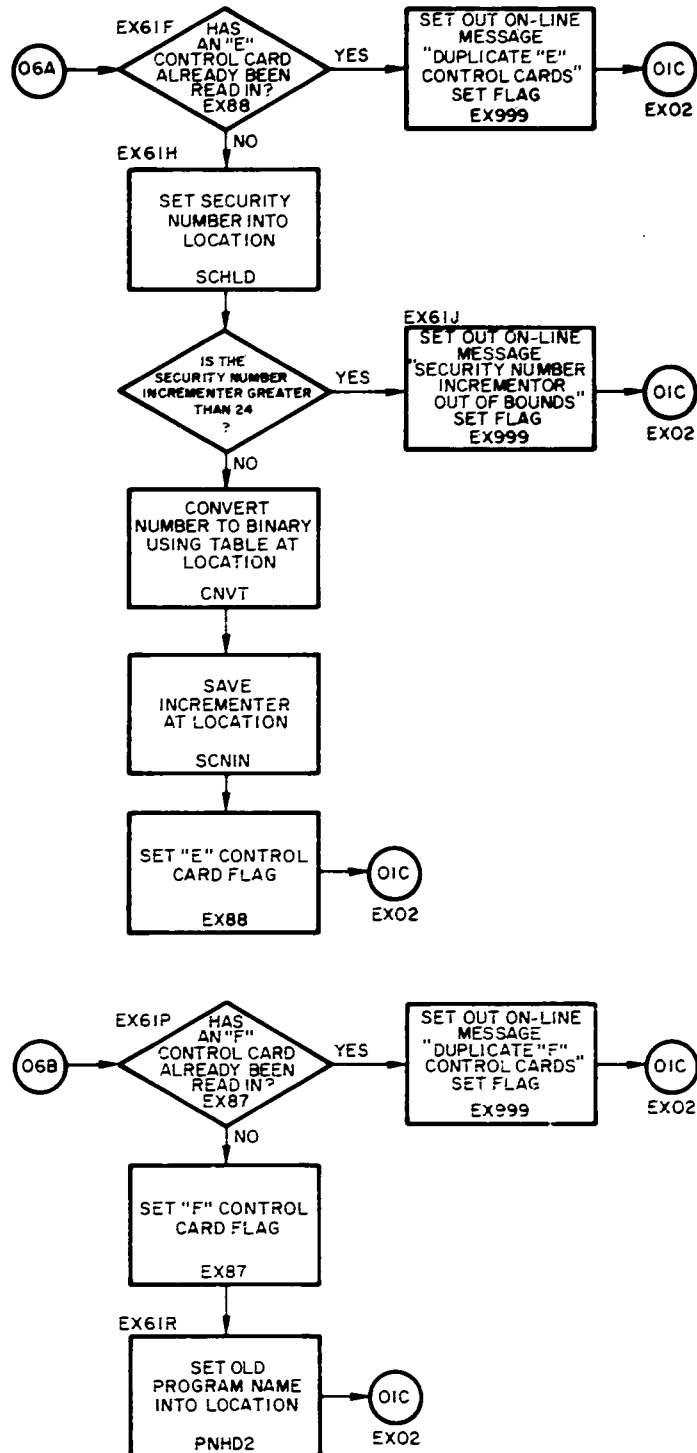


# REGION EXECUTIVE

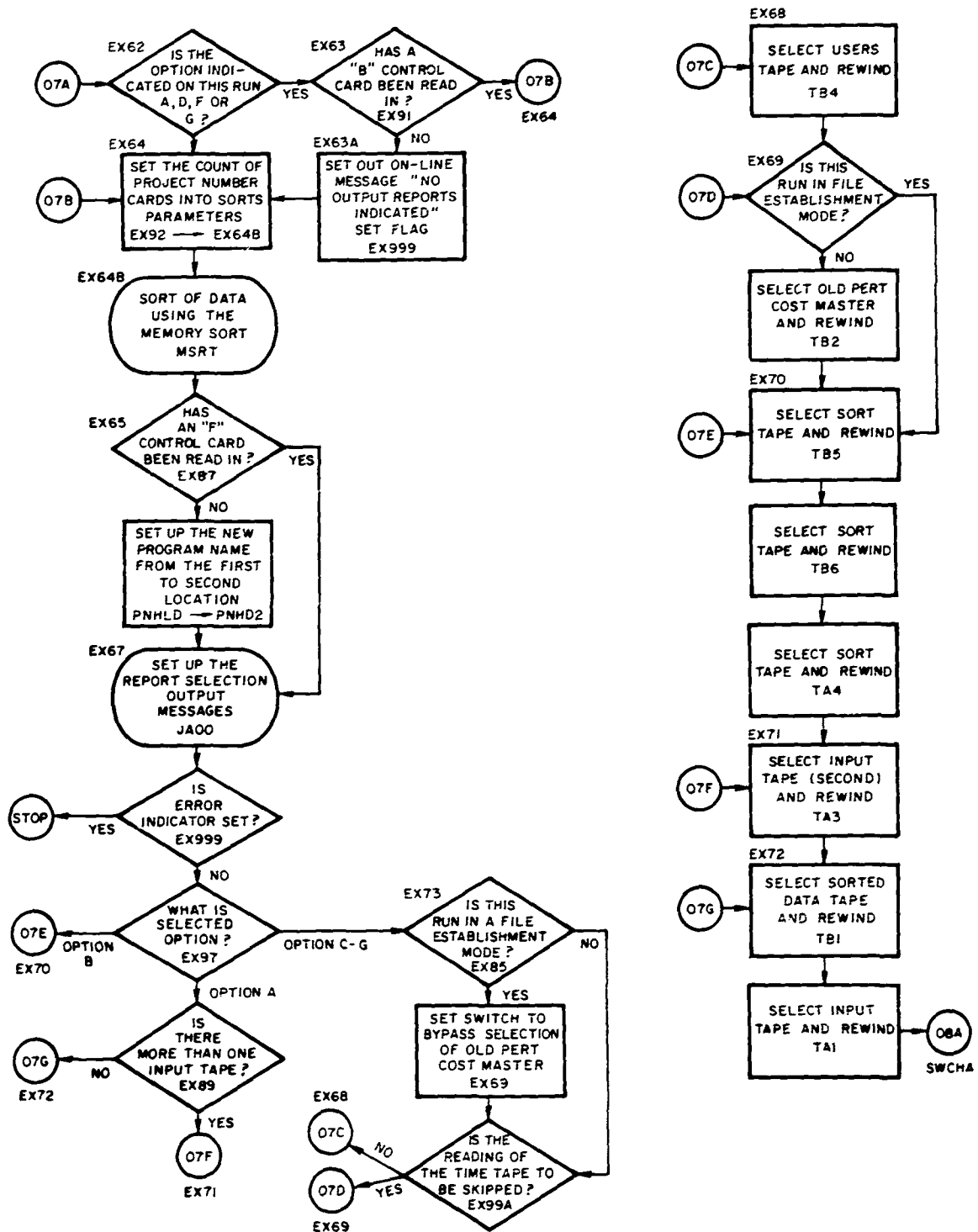




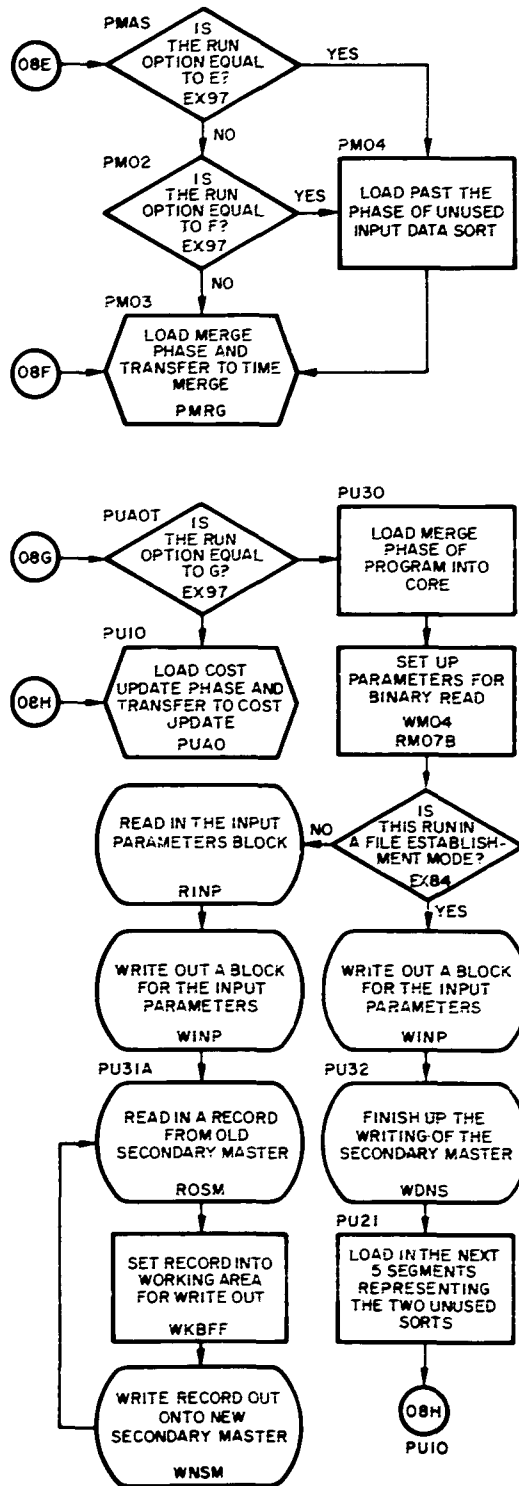
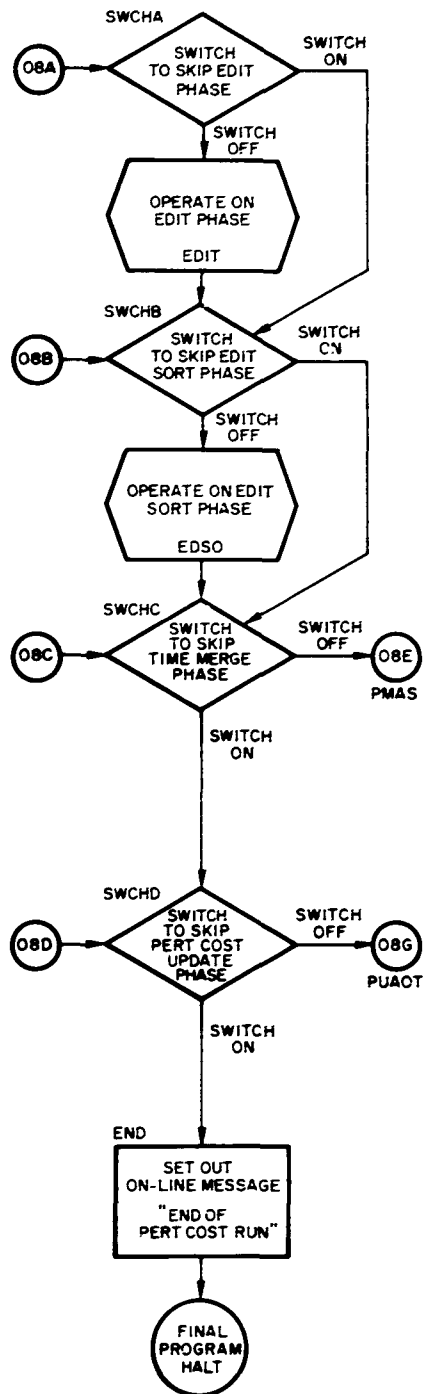
REGION EXECUTIVE



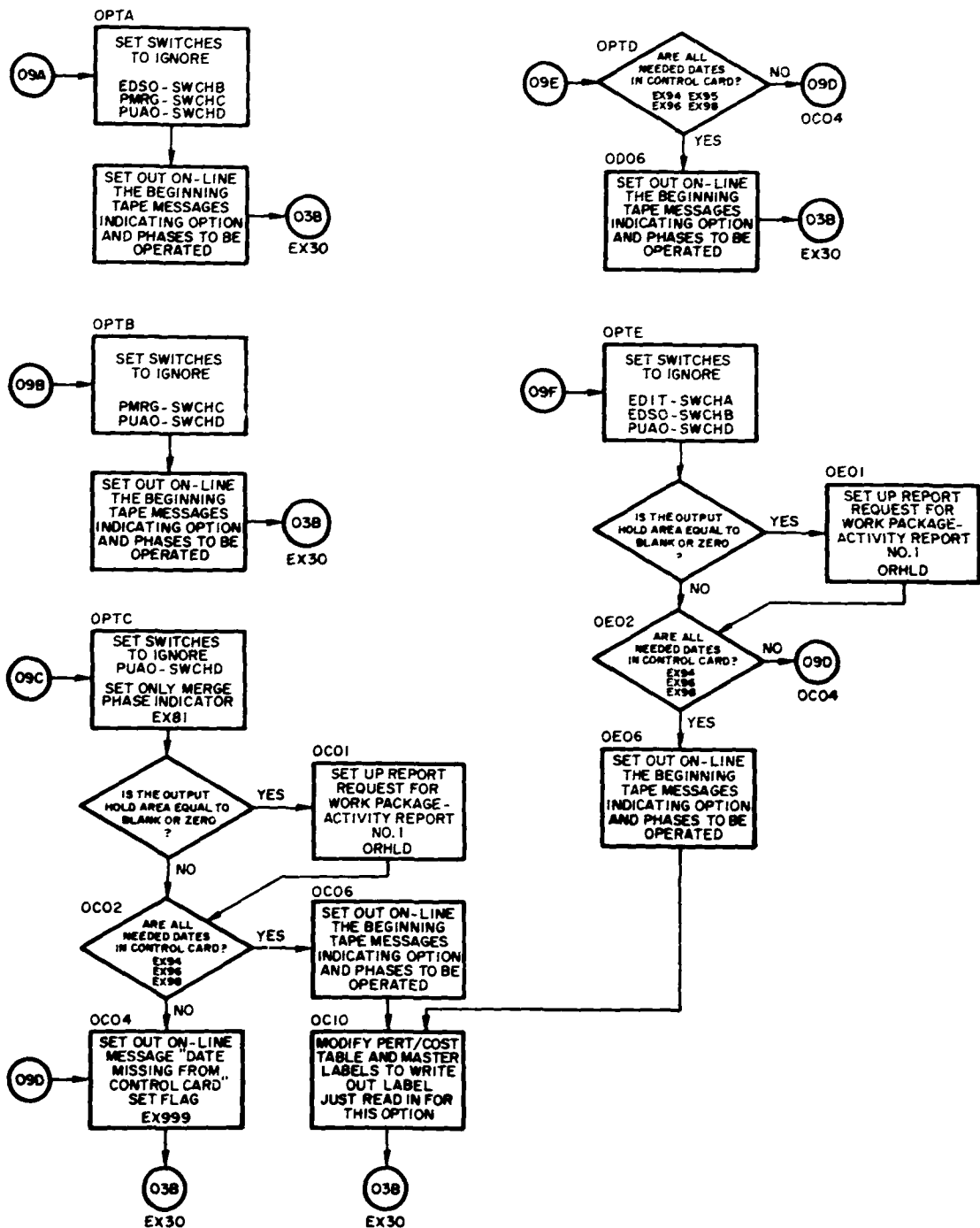
# REGION EXECUTIVE



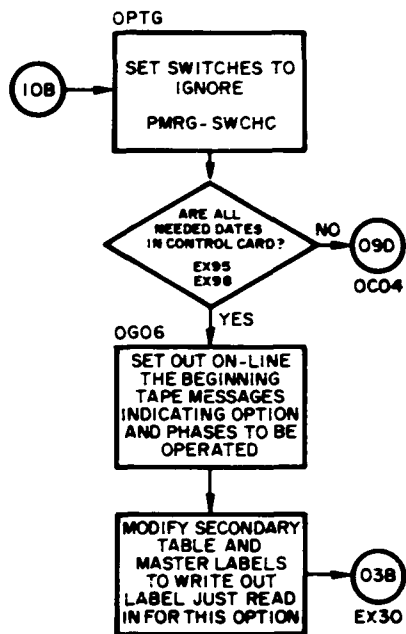
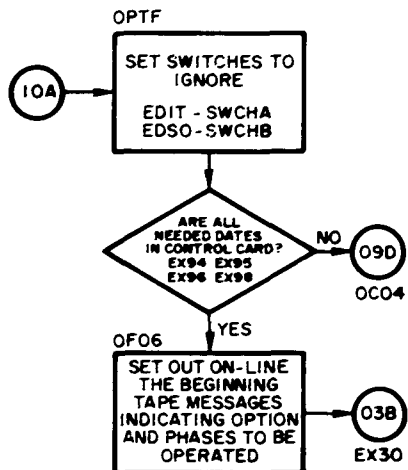
# REGION EXECUTIVE



REGION EXECUTIVE



# REGION EXECUTIVE



Region DTCR

EXPLANATION OF REGION:

This routine will take a seven-character date and convert it into DD-MM-YY and verify the figures.

CALLING SEQUENCE:

L        TSX        DTCR, 4

L + 1    Normal return

INPUT:

The date will come in as XXXXDD in the accumulator and MMMYYX in the MQ.

OUTPUT:

The date in the form of DD-MM-YY will come out in the accumulator.

STORAGE USED:

DTTB    - 12 words - Hold range of days tied to month

DTTB2   - 12 words - Hold legitimate months

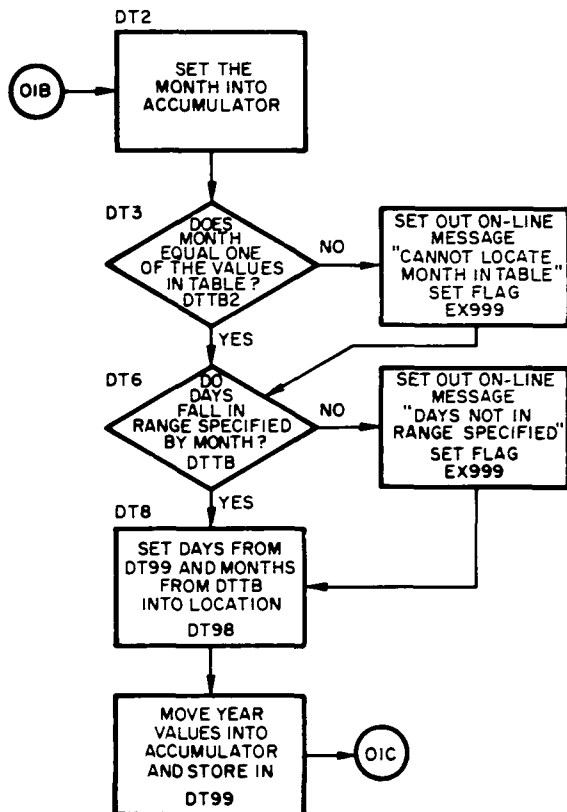
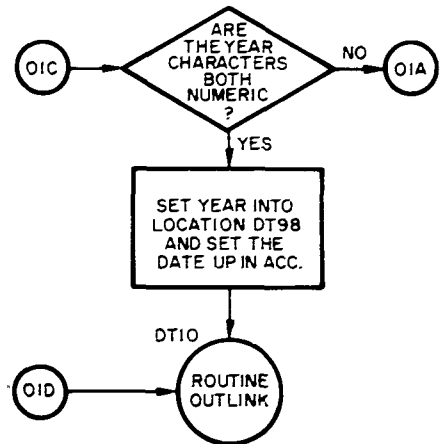
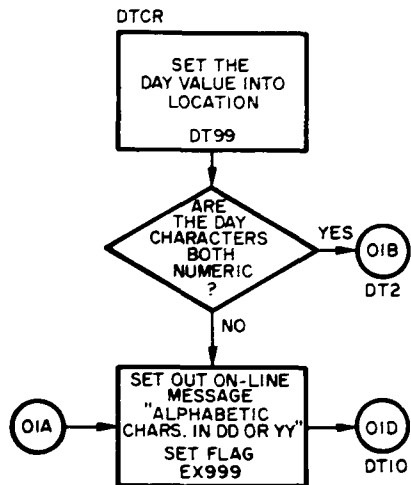
SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

If an error is found, a message is put out on the on-line printer, and the program is stopped.

REGION DTCR



Region TUASN

**EXPLANATION OF REGION:**

This routine will set up the new tape unit to be reassigned from the "D" control card.

**CALLING SEQUENCE:**

L       TSX       TUASN, 4  
L + 1   Zero or blank return  
L + 2   Normal return

**INPUT:**

The "D" control card

**OUTPUT:**

The tape channel and number in the address of the accumulator.

**STORAGE USED:**

Not applicable

**SUBREGIONS AND SUBROUTINES USED:**

Not applicable

**EXPLANATION OF CALLING SEQUENCE:**

If an error is found, a message is put out on the on-line printer, and the program is stopped.



Region PMAS

EXPLANATION OF REGION:

This routine will set up the segments of the program to operate upon for the PERT merge phase.

CALLING SEQUENCE:

L        TSX        PMAS, 4  
L + 1    Normal return

INPUT:

Not applicable

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

The outlink from this routine will take the system into PMRG

Region PUAOT

EXPLANATION OF REGION:

This region will set up the segments of the program to operate upon for the PERT cost update phase.

CALLING SEQUENCE:

L        TRA        PUAOT

INPUT:

Not applicable

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

The outlink from this region will take the system into PUAO from which it will go into the output routine leaving the executive control section.

Region JA00

EXPLANATION OF REGION:

This routine will unpack the output report selections so that they can be deciphered by the output section.

CALLING SEQUENCE:

L       TSX       JA00, 4  
L + 1    Normal return

INPUT:

ORHLD table set up with the "B" control cards.

OUTPUT:

On-line printing indicating the reports selected.

The ORPT table containing the deciphered output report selections.

STORAGE USED:

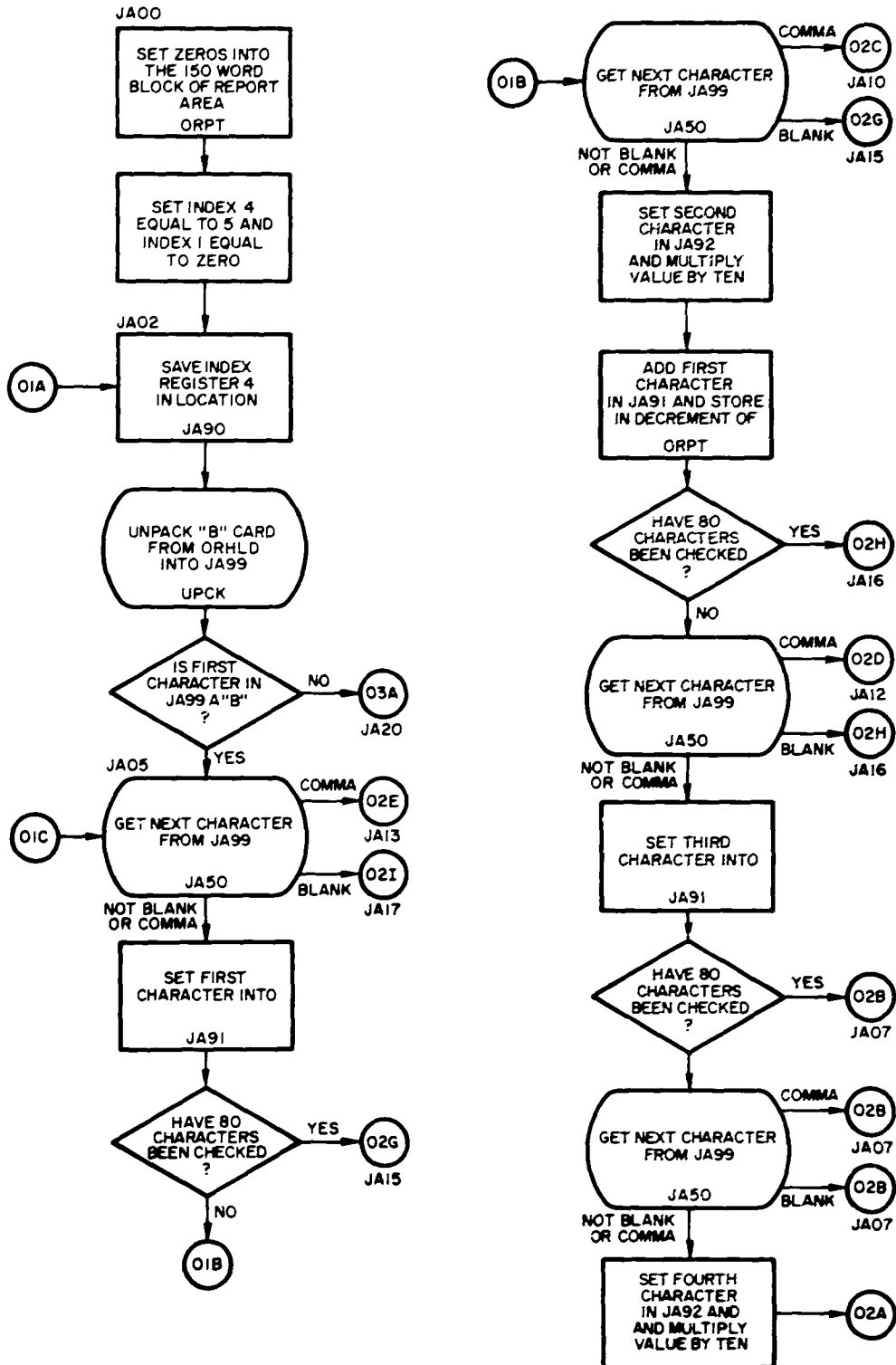
ORPT - 150 words - Hold deciphered output report  
                  selections

SUBREGIONS AND SUBROUTINES USED:

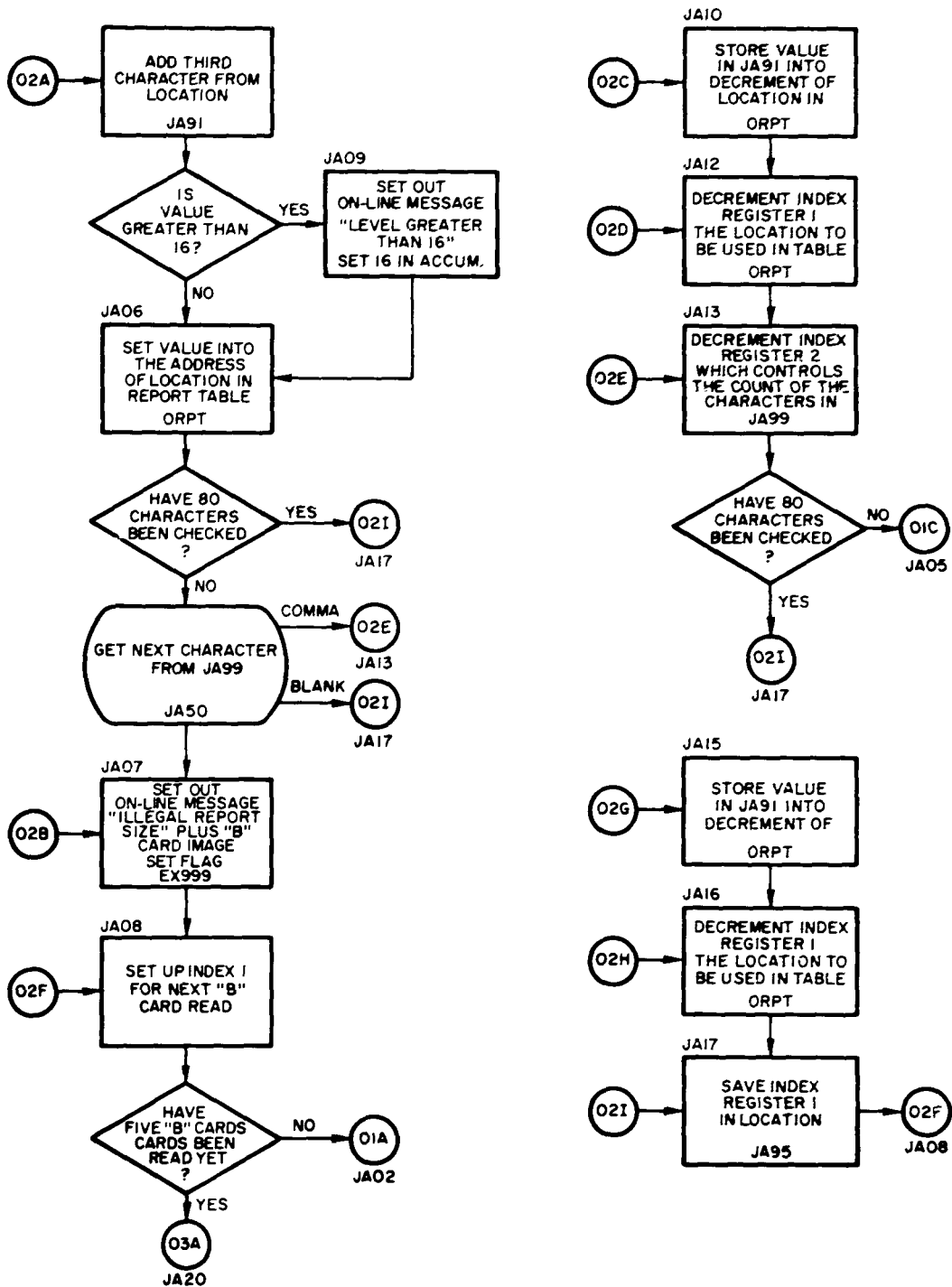
Not applicable

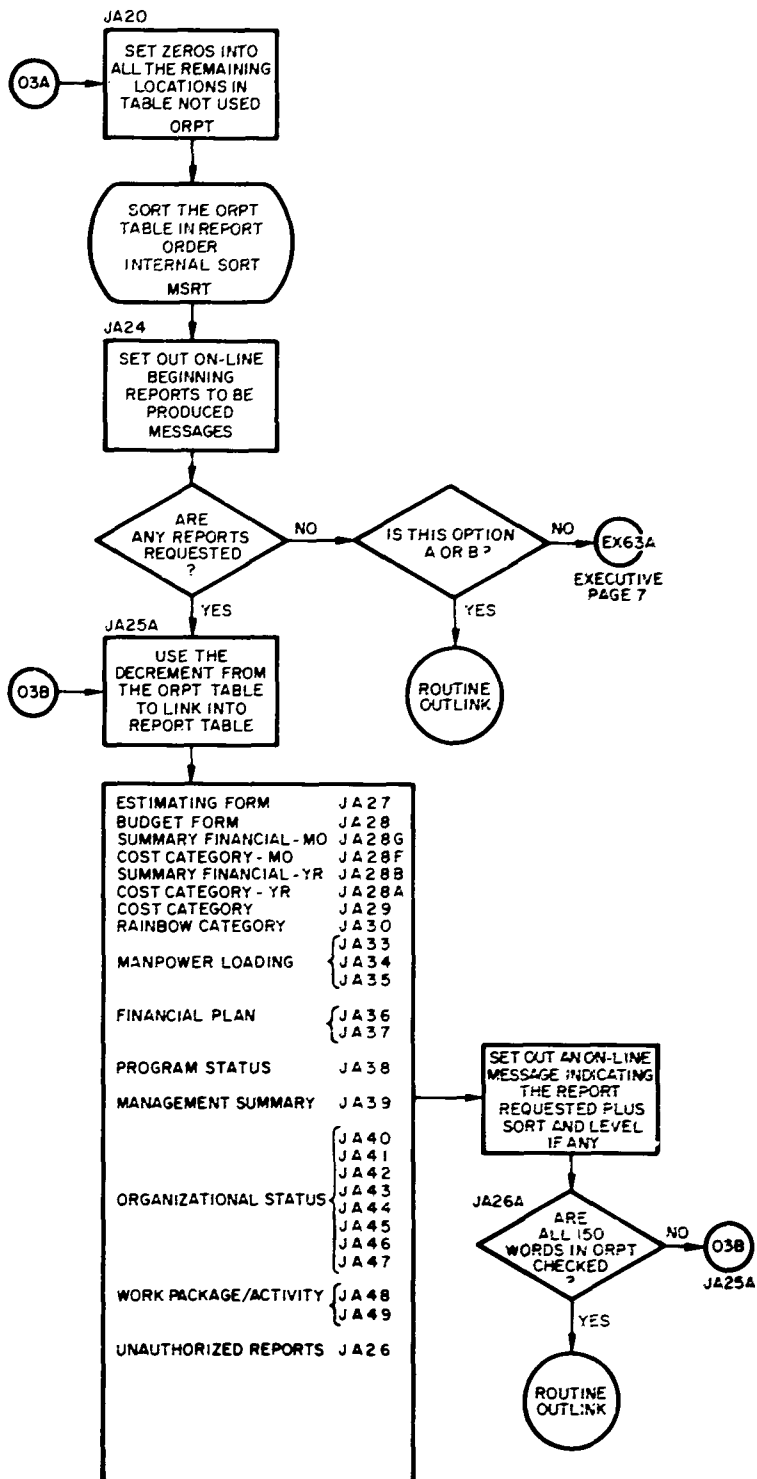
EXPLANATION OF CALLING SEQUENCE:

Not applicable



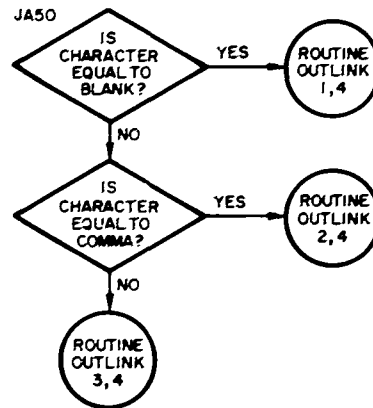
REGION JA00



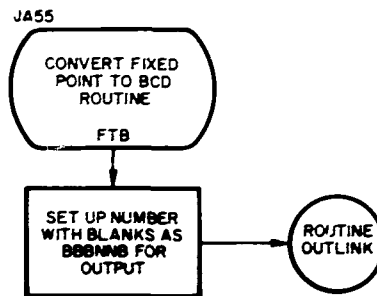


# REGION JAOO

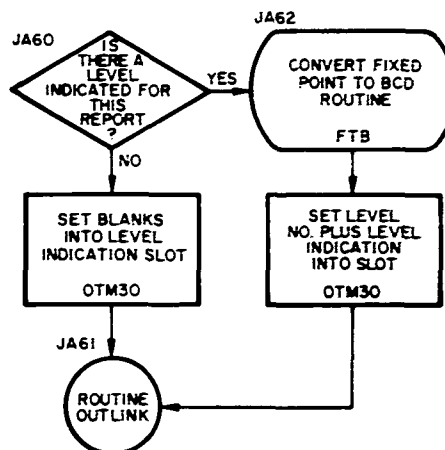
## JA50 - CHARACTER TYPE DETERMINATION



## JA55 - CONVERT BINARY NUMBER TO BCD



## JA60 - SET UP LEVEL INDICATION



### III-D PERT COST EDIT PHASE

This phase will accomplish the input data editing. It will select the acceptable data, write the data out on the EDITED DATA TAPE, and write the errors on the SYSTEM ERROR TAPE. At the end of the edit phase, a message will indicate the number of errors encountered during the processing which will be displayed on the on-line printer. This message will take one of the following forms:

1. XXXX ERRORS DETERMINED  
IF RUN IS TO BE CONTINUED EVEN THOUGH ERRORS  
INDICATED HIT START
2. NO ERRORS DETERMINED

If the option indicated is only the edit phase, the program will come to its normal conclusion with or without input errors, and only the first line of message (1) or message (2) will be printed out. When the option indicated exceeds the edit phase, a halt will occur, and message (1) will indicate the number of input errors encountered. If these errors are to be ignored, the start button at the console is hit, and these input errors are bypassed. The program will then go into the edit sort phase. For the case where there are no errors indicated and the option code exceeds the edit phase, the program will go into the edit sort automatically after message (2) is printed.

#### Input Editing Data Tape Labels

The input data information can be entered into the system with any one of the three following labels as the first record on tape:

| Column → |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1        | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| U        | N | S | O | R | T | E | D |   | R  | A  | W  |    | D  | A  | T  | A  |    | T  | A  | P  | E  |
| A        | C | T | U | A | L |   |   | R | A  | W  |    | D  | A  | T  | A  |    | T  | A  | P  | E  |    |
| E        | D | I | T | E | D |   |   | R | A  | W  |    | D  | A  | T  | A  |    | T  | A  | P  | E  |    |



The "UNSORTED RAW DATA TAPE" label is set in front of all input that is in the form of cards and will have to go through a card-to-tape procedure.

The "ACTUAL RAW DATA TAPE" label will be placed onto any input tape that is generated from another computer program and will eventually be fed into the PERT Cost system.

The "EDITED RAW DATA TAPE" label will be set onto the front of all correct data that has previously passed through the edit phase. The label on this tape will indicate that no editing is necessary for this information because it has already been done. For INPUT DATA TAPE label checking, only the first four words are verified for acceptability. When this tape is used as the EDITED DATA TAPE in the edit sort phase, the entire label is checked as is discussed on Page III-E-12. This entire label takes the form on tape of two records, the first record of six words and the second of four.

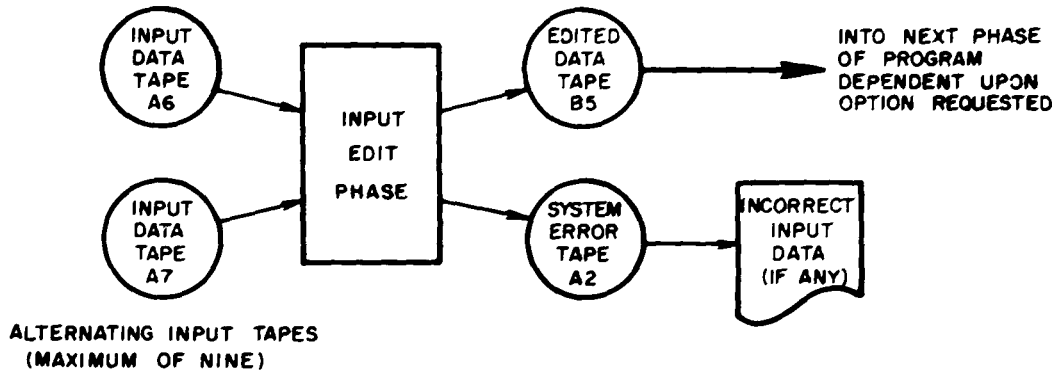
Each tape (if more than one is required) will contain one of the above three labels as the first record on that tape. All records on the INPUT DATA TAPE will be unblocked, and no prior sort will be required, because the edit sort phase will accomplish this. Any combination of input tapes (to a maximum of nine) containing the above three labels can be read in during any cyclic or file establishment run.

#### Input Editing Tape Operations

The edit phase allows for alternating input tapes A6 and A7. If only one input tape is required for this run, it will be placed on tape unit A6, with a blank tape set on A7 if the option requires it. A maximum of nine alternating input tapes can be used. The output from these alternating input tapes, which has been acceptable to the edit program, is set out on tape unit B5. A maximum of nine reels of B5 can be created during any run.

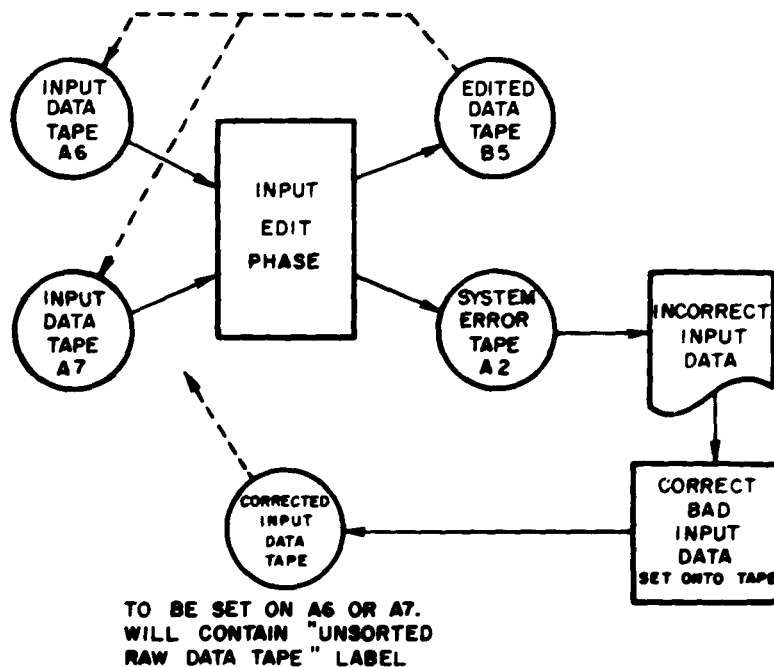
The tape flow during the input editing phase will take the following form:

- a. If all input data are correct or if the bad data are to be ignored:



The printout of the SYSTEM ERROR TAPE will take place after the completion of this run.

- b. If a portion or all of the input data is incorrect and it is to be corrected:



The printout of the SYSTEM ERROR TAPE will take place after the completion of the edit phase. The errors indicated on this tape will be corrected and new input cards punched reflecting these corrections. These cards, along with the new control cards, will then go card-to-tape with a label of "UNSORTED RAW DATA TAPE" preceding the input. This tape and the tape containing the acceptable data (EDITED DATA TAPE) will be mounted on units A6 and A7. The tape containing the current control cards must be mounted on A6. The program will then be restarted from the beginning.

#### Input Editing Tape Messages On-Line

The messages forthcoming on the on-line printer regarding the alternating input and edited tapes will be as follows, depending on the number of tapes used and the governing option:

a) Only one input tape and Option A

TAPE A6 HAS BEEN SELECTED FOR READING  
TAPE B5 HAS BEEN SELECTED FOR WRITING  
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD  
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD  
END OF PERT EDIT PHASE

The above set of messages will be followed by the error-indication messages described on Page III-D-1. Error messages will likewise follow all of the tape messages described in the examples below.

b) Two input tapes and Option A

TAPE A6 HAS BEEN SELECTED FOR READING  
TAPE B5 HAS BEEN SELECTED FOR WRITING  
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD  
TAPE A7 HAS BEEN SELECTED FOR READING  
TAPE A7 IS NOW REWINDING AND SHOULD UNLOAD  
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD  
END OF PERT EDIT PHASE

While A6 is rewinding, Tape A7 is being read to speed up computer processing. This is true for all the alternating reads.

- c) Three or more input tapes, Option A, and multiple edited tapes

TAPE A6 HAS BEEN SELECTED FOR READING  
TAPE B5 HAS BEEN SELECTED FOR WRITING  
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD  
SET NEXT REEL OF THIS SERIES ON TAPE A6  
TAPE A7 HAS BEEN SELECTED FOR READING  
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD  
SET NEXT REEL OF THIS SERIES ON TAPE B5  
TAPE A7 IS NOW REWINDING AND SHOULD UNLOAD  
TAPE A6 HAS BEEN SELECTED FOR READING  
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD  
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD  
END OF PERT EDIT PHASE

The above process can continue until nine input tapes have been read from A6 and A7. A maximum of nine B5 tapes can be created during any one run. The EDITED DATA TAPE is not alternating, and therefore the program must wait until the tape is rewound, unloaded, and a new tape loaded prior to proceeding.

- d) Only one input tape and Option B

The on-line messages will take the same form as shown in (a) except for message line 4, which will appear as follows:

TAPE B5 IS NOW REWINDING

Tape B5 is not unloaded in this option because it is to be used in the edit sort phase of the program.

- e) Two input tapes and Option B

The on-line messages will take the same form as shown in (b) except for message lines 5 and 6, which will appear as follows:

TAPE A7 IS NOW REWINDING  
TAPE B5 IS NOW REWINDING

Tape A7 is not unloaded for this option because it will become one of the sort and merge tapes.

- f) Three or more input tapes, Option B, and multiple-edited tapes

The on-line messages will take the same form as shown in c) except for message line 8, which will appear as follows:

TAPE A7 IS NOW REWINDING

The above message applies to the final reference made to tape A7. All previous messages referring to A7 will involve a rewind and unload of the tape. Tape B5 is re-wound and unloaded if multiple EDITED DATA TAPES are created. The reason for this operation is to reload the first B5 created onto the unit so that in the edit sort the data are reread in the order they were created.

- g) Only one input tape and Options C to G

The on-line messages will take the same form as shown in a) except for message lines 3 and 4, which will appear as follows:

TAPE A6 IS NOW REWINDING

TAPE B5 IS NOW REWINDING

Tape A6 is not unloaded in these options because it will be used for the new PERT COST MASTER TAPE. Tape B5 is not unloaded because it will be input to the edit sort phase.

- h) Two input tapes and Options C to G

The on-line messages will take the same form as shown in b) except for message lines 3, 5 and 6, which will appear as follows:

TAPE A6 IS NOW REWINDING

TAPE A7 IS NOW REWINDING

TAPE B5 IS NOW REWINDING

Tape A7 is not unloaded for these options because it will become one of the sort and merge tapes.

- i) Three or more input tapes, Options C to G, and multiple-edited tapes

The on-line messages will take the same form as described in f) except that line 10 of c) will be changed as follows:

TAPE A6 IS NOW REWINDING

The above message applies to the final reference made to tape A6. All previous messages referring to A6 will involve a rewind and unload of the tape.

#### Input Editing Off-Line Error Messages

The errors determined during the edit phase are set out on the SYSTEM ERROR TAPE. There are no on-line indications regarding this tape. The SYSTEM ERROR TAPE is never rewound or unloaded unless it has reached end-of-tape. The removal of this tape at program end is a manual operation.

During the edit phase operation, the program will edit input cards until the first error is located. This error will be set out on the SYSTEM ERROR TAPE, whereupon the program will proceed to edit the next input card.

During the edit phase, the following errors and accompanying messages can be forthcoming:

- a. ERROR IN CARD CODE

XX - 80 characters of input card - XX

If the input card code is not in the range of 1 to 7, or is a 3, this message will be set out. (Note: the second line of this and all other messages in this section will be a reproduction of the input card to which this message applies.)

- b. NOT A LEGITIMATE CHANGE CODE

The change code does not correspond to R, T, and D for 7-3 card inputs or A, C, and D for the others.

c. JUSTIFICATION ON A FIELD OF THIS INPUT IN ERROR

If a field contains data that is not properly justified, this message is set out. The one exception to this rule is where an asterisk is used to clear out a field and this asterisk is always left-justified.

d. ERROR ON INPUT PARAMETER CARD CODE

The 1-type input card is not in the range of A to C. If the A to C range is verified, the following card number ranges are checked:

1. A - Range 1 to 9
2. B - Range 1 to 75
3. C - Range 1 to 19

e. NO PREDECESSOR NUMBER FOR ACTIVITY

If the predecessor is blank or zero on a 2-type input, this message is put out.

f. NO SUCCESSOR NUMBER FOR ACTIVITY

The successor is blank or zero on a 2-type input.

g. NO CHARGE NO. TIED TO AN ACTIVITY

The charge number is blank or zero on a 2-type input and it is not a delete code.

h. NO RESOURCE CODE TIED TO RATE INPUT

The resource code is blank or zero on a 4-type input.

i. RATE INPUT YEAR OUT OF RANGE

The year is alphabetic or not in the range of 6X or 7X.

j. RATE INFORMATION MISSING ON RATE INPUT

If both the unit rate and overhead rate are absent from a field that has a year related to it and the change code is not a delete.

**k. ALPHABETIC CHARACTERS IN RATE INPUT**

The rate fields contain a character other than blank, decimal point, or 1 to 9 on a 4-type card input.

**l. YEAR QUARTER ON RATE CHANGE NOT IN RANGE**

The quarter if indicated is not in the range of 1 to 4 on one of the fields on a 4 card input.

**m. NO RAINBOW CATEGORY TIED TO INPUT CARD**

The rainbow category field on a 5 card is zero or blank.

**n. SKILL CODE INFO MISSING ON SKILL INPUT**

The first resource or skill code field on a 5 or 6 card input is blank or zero and card code is not a delete.

**o. NO COST ELEMENT CODE TIED TO INPUT CARD 6**

The cost element code field on a 6 card is zero or blank.

**p. ERROR IN SECONDARY CODE**

The secondary code (column 78) on 7 card input is not in the range of 0 to 5.

**q. NO CHARGE NO. TIED TO COST INPUT**

The charge number is blank or zero on 7 card input.

**r. CHARGE NO. START DATE IN ERROR**

The start date uses a bad month, alphabetic days or years, or the days do not fall in the range specified by its month.

**s. CHARGE NO. COMPLETE DATE IN ERROR**

The complete date uses a bad month, alphabetic days or years, or the days do not fall in the range specified by its month.

**t. LEVEL CODE OUT OF BOUNDS**

The work breakdown level code is not in the bounds of 1 to 16.



- u. NO PERFORMING UNIT TIED TO COST INPUT  
The performing unit is blank or zero on 7-3, 7-4, or 7-5 card inputs.
- v. NO RESOURCE CODE TIED TO COST INPUT  
The resource code is blank or zero on 7-3, 7-4, or 7-5 card input.
- w. NOT A LEGITIMATE INPUT CATEGORY TYPE  
The UDC code is not a legitimate code of H, D, M, T, and U for 7-3, 7-4, and 7-5 inputs.
- x. NON-NUMERIC CHARACTERS IN COST FIELDS  
The values in the numeric fields of the 7-3, 7-4, and 7-5 input cards contain a character other than blank or 0-9. The 7-3 actual input may contain an alphabetic character in the first position of the field due to the possibility of having a minus sign overpunch.
- y. NO MONTH OR YEAR IN ACTUAL INPUTS  
On a 7-3 input which is not a delete, there is no month or year shown for a field with a UDC code.
- z. MONTH AND YEAR OF ACTUAL INPUTS AFTER TIME NOW  
The date on a field of the 7-3 actual input card is after the time-now date.
- aa. NON-NUMERIC CHARACTERS IN DATE FIELD  
The 7-3 input card date uses a non-numeric month and year, other than blank.
- bb. THIRD CODE INCORRECT  
The code (column 79) on a 7-4 or 7-5 input card is not in the range of 0-9.

cc. A FIELD ON THIS INPUT SHOULD CONTAIN A VALUE

All value fields on the 7-4 or 7-5 input cards are blank, and the change code is not delete

dd. NO DATA ON INPUT CARD

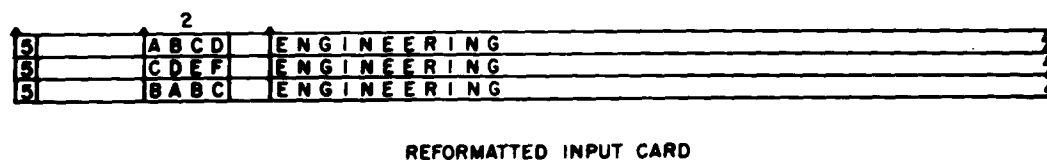
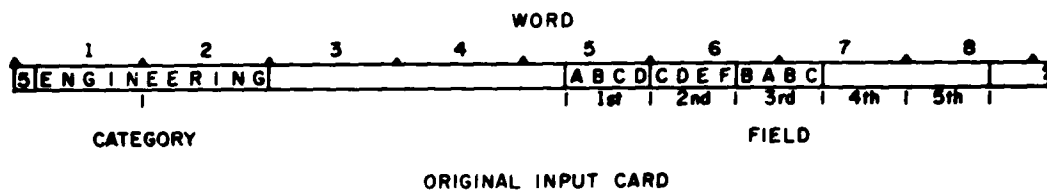
The input card should contain some information in the body data, but these data are all blank or zero.

#### Input Editing Program Operations

The following are some of the programming approaches that have been followed in the edit phase:

a. 5 and 6 Card Reformatting

Both the 5 and 6 input cards can have one or many resource codes tied to a category. Since the program logic uses the resource code as the indicative information on the card, except for category deletes, the fields are switched during the edit phase. For every resource code, a card is developed as shown:



The above holds true for both 5 and 6 cards. The change code remains in the same location, column 80, even after reformatting.

b. ZERO EDITING

To set up the fields that are involved in sorts, a zero editing approach is used. All leading blanks are transformed to zero. If a blank falls between two valid characters, it is left as a blank. The fields that are zero-edited include:

1. predecessor number
2. successor number
3. charge number
4. network code
5. performing unit
6. resource code
7. responsible organization
8. charge number next higher relation (father).

c. DELETE CHANGE CODE CONVERSION

In developing the sort for the input cards that contain a change code, the following order was used for all but the 7-3 cards:

1. adds or change code A
2. delete or change code D
3. changes or change code C

To make the processing easier, and to get the right order in the change code automatically, all codes having a D were change to B on the EDITED DATA TAPE.

d. CLEAR-OUT OF A FIELD

To set a field other than a value field to a blank, an asterisk is placed in the leftmost column of the field. Justification is disregarded for this case.

### Input Editing Region Descriptions

The following region descriptions will describe the major subroutines used in the edit phase as well as the edit phase itself. Behind each region description will be one or more flow charts describing that region.

### Region EDIT

#### EXPLANATION OF REGION:

This routine will accomplish the input data editing. It will select the acceptable data, write it out on the EDITED DATA TAPE, as well as writing the errors on the SYSTEM ERROR TAPE.

#### CALLING SEQUENCE:

L       TSX       EDIT, 4  
L + 1    Normal return

#### INPUT:

Up to nine INPUT DATA TAPES

#### OUTPUT:

Up to nine EDITED DATA TAPES for the acceptable data  
The SYSTEM ERROR TAPE for all unacceptable data

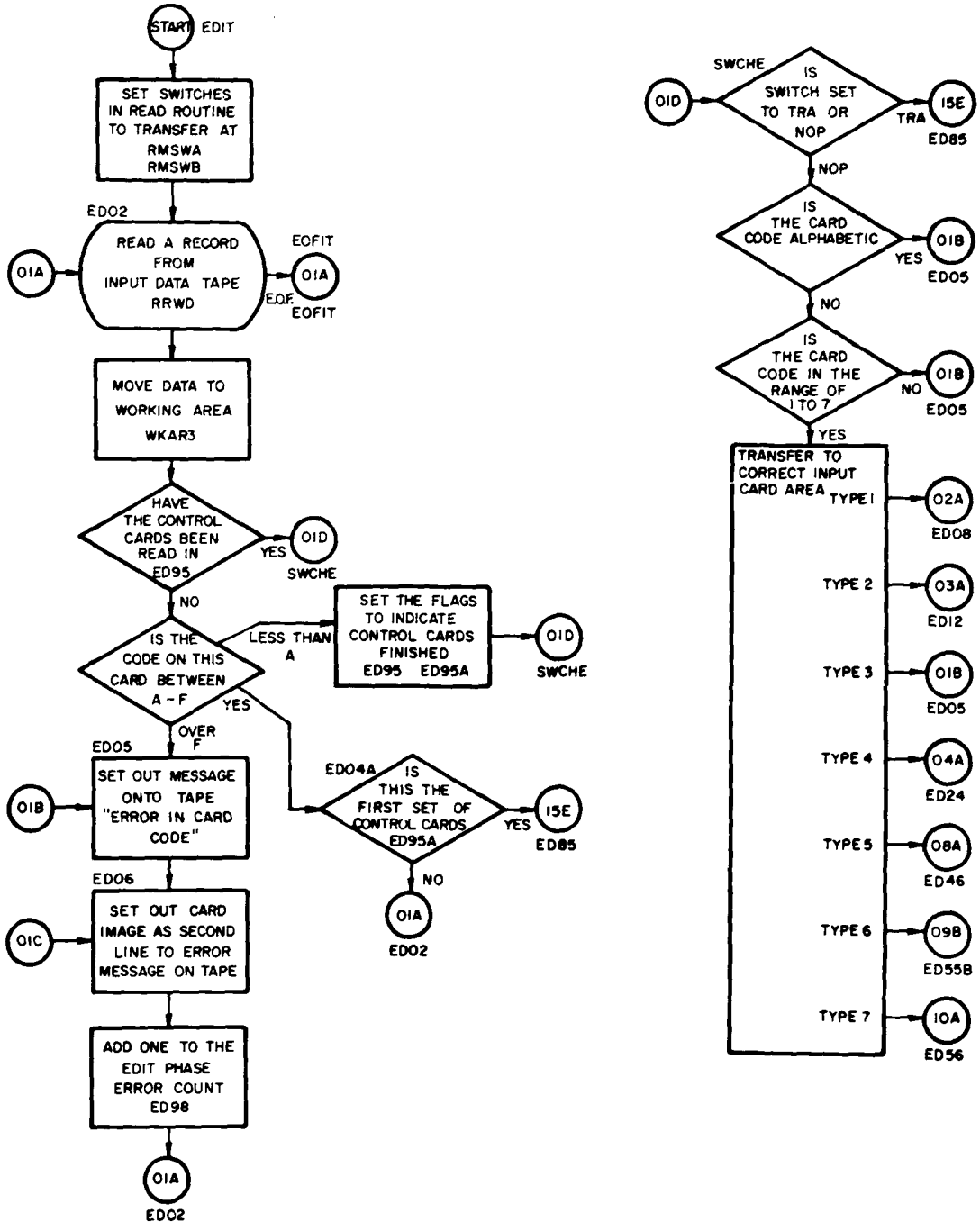
#### STORAGE USED:

ED 96 - Flag to indicate if there is any information on input card.  
          0 will indicate no information.  
ED98 - Count of errors found in edit phase.  
ED99 - Flag to indicate if there is any rate input data.  
          0 will indicate no data on rate input.

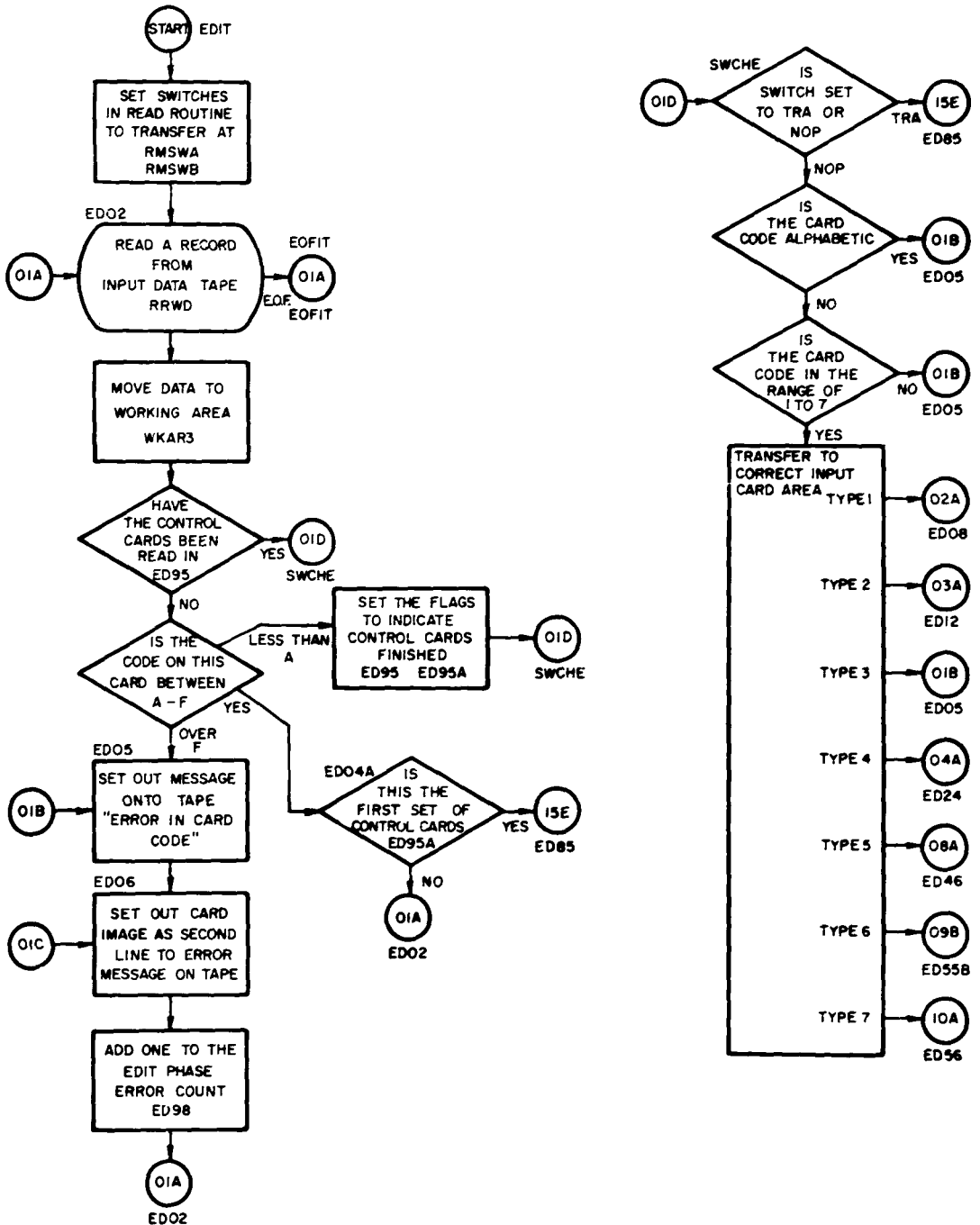
#### SUBREGIONS AND SUBROUTINES USED:

|       |        |
|-------|--------|
| CNCK  | CHCD2  |
| DTED  | EOFIT  |
| PURC  | CHGCD  |
| INFT  | EDITOR |
| MYCK  | RRWD   |
| FDCK  | WRWD   |
| FDCK2 |        |

# REGION EDIT

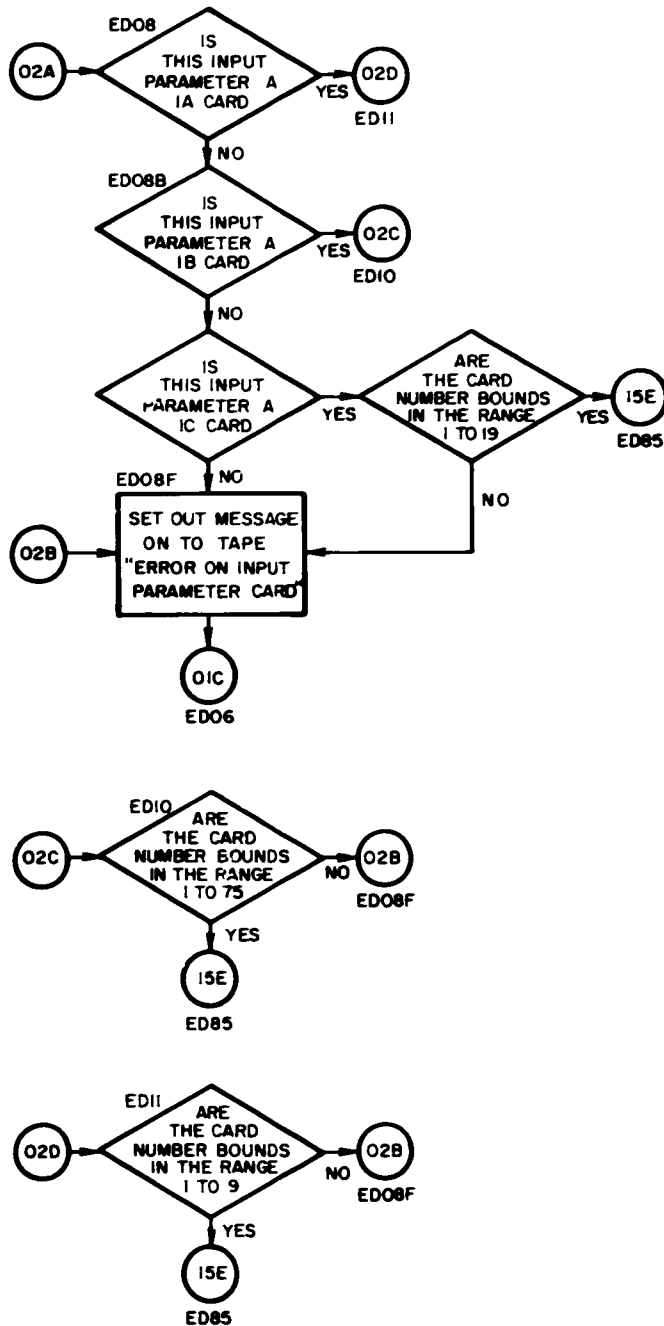


# REGION EDIT



# REGION EDIT

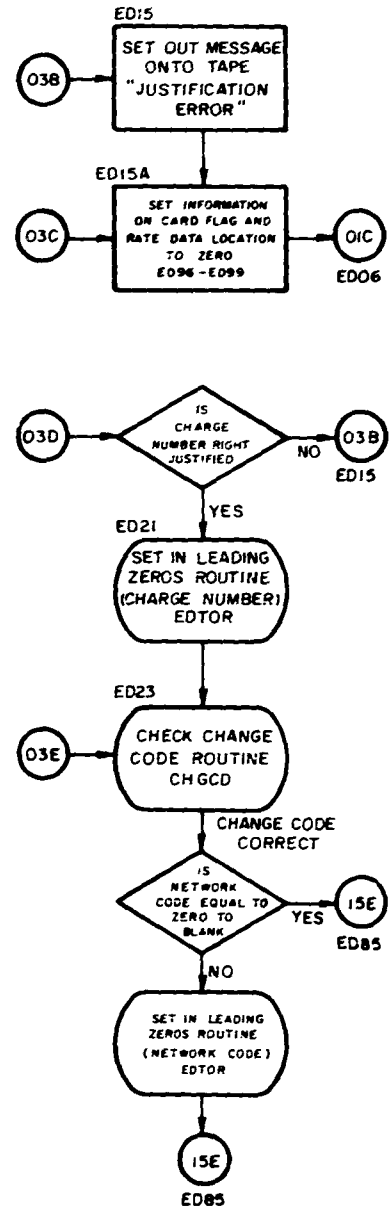
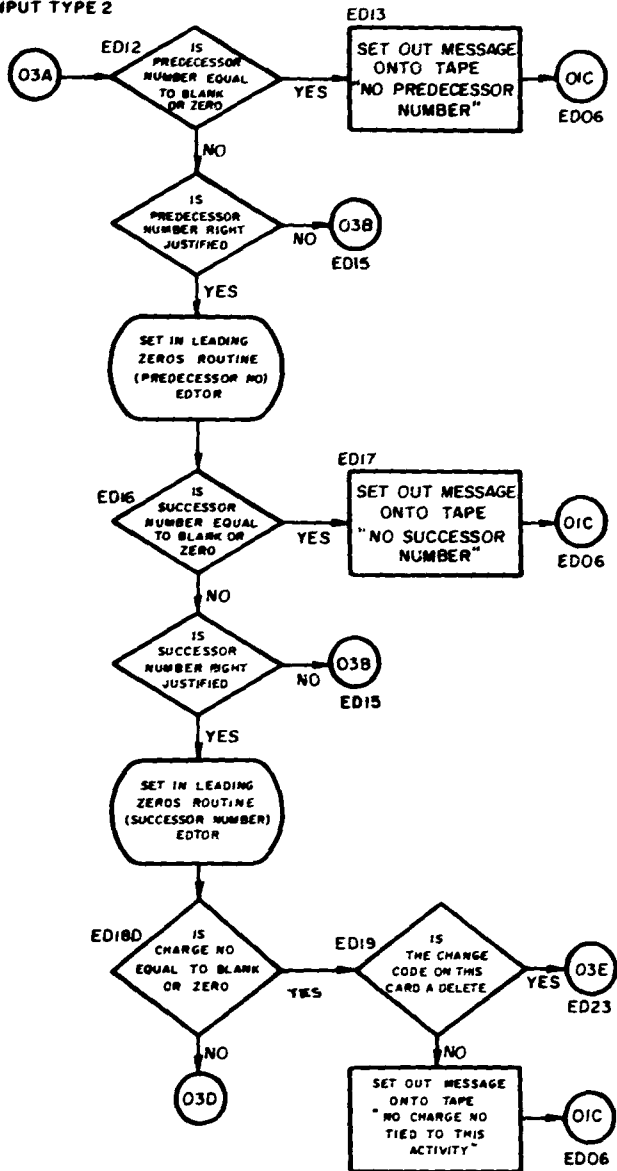
INPUT TYPE I





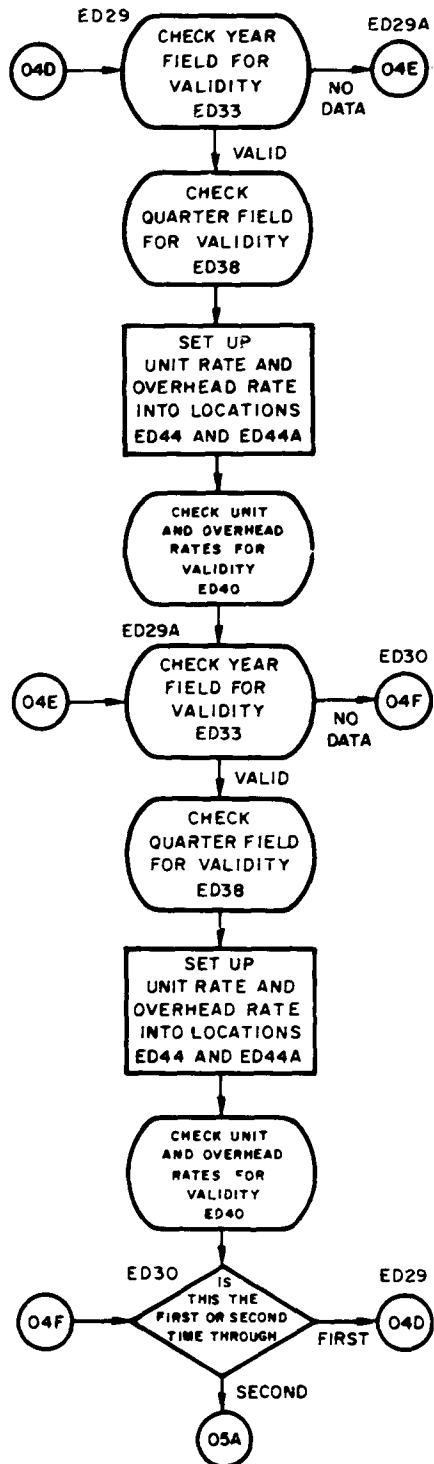
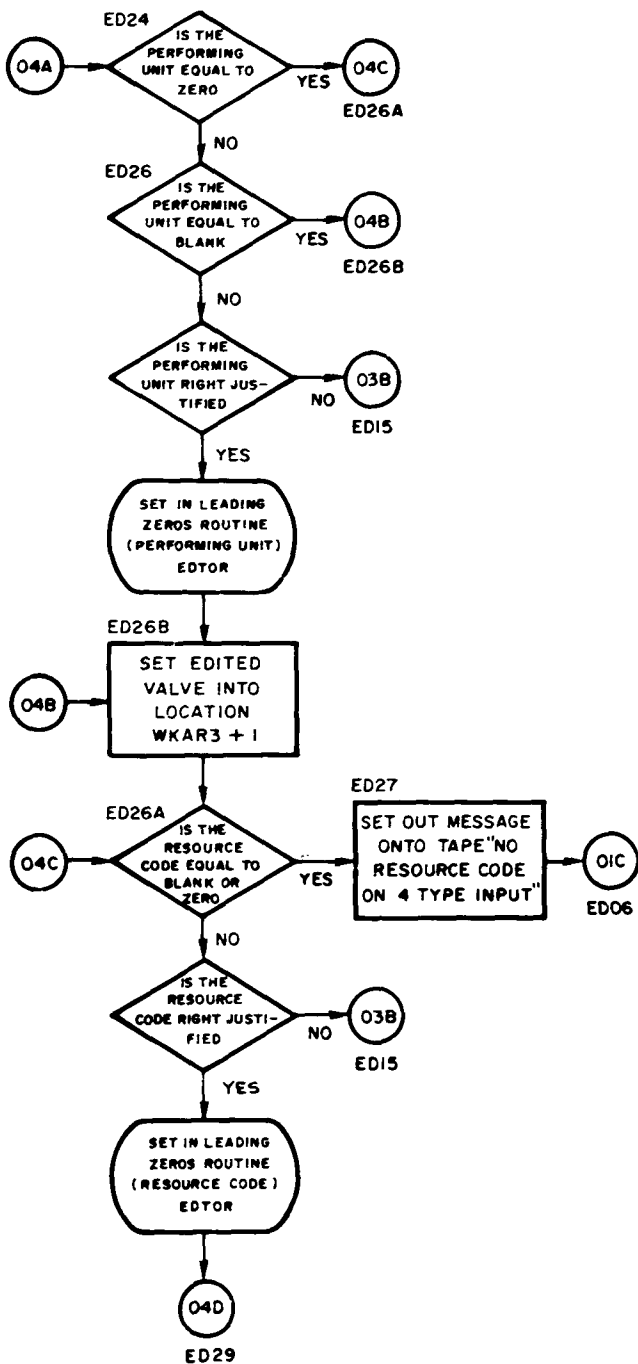
# REGION EDIT

INPUT TYPE 2



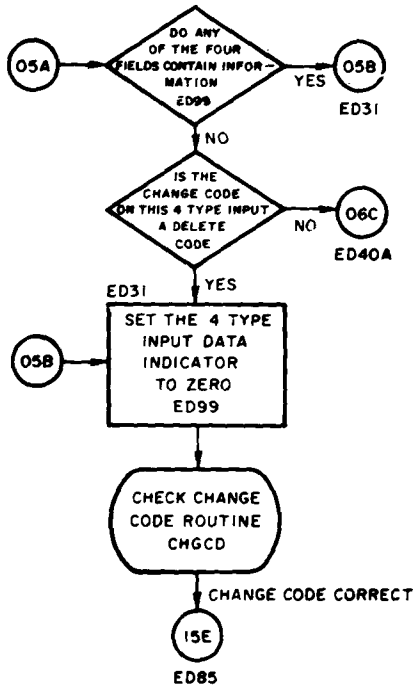
# REGION EDIT

INPUT TYPE 4

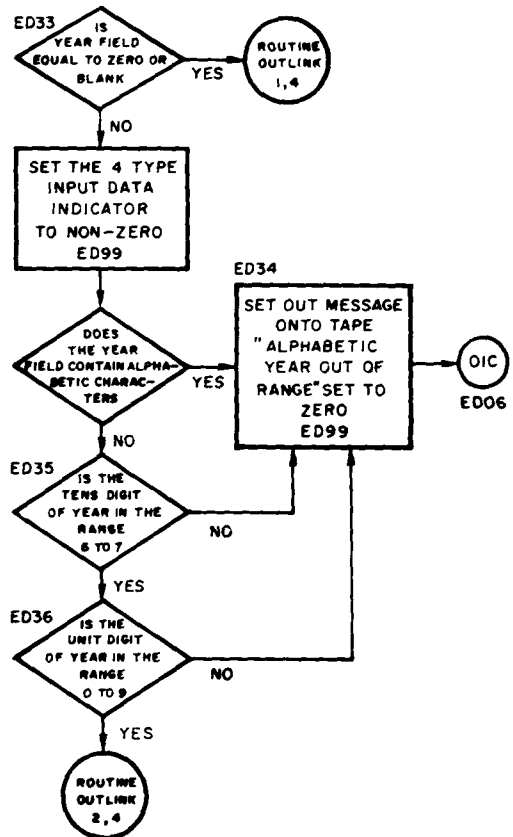
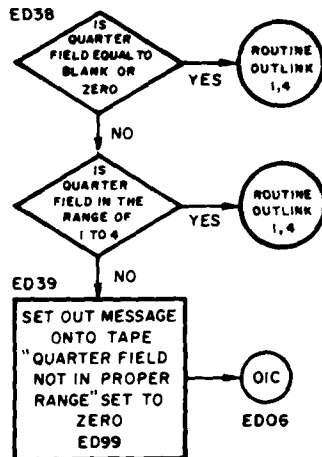


# REGION EDIT

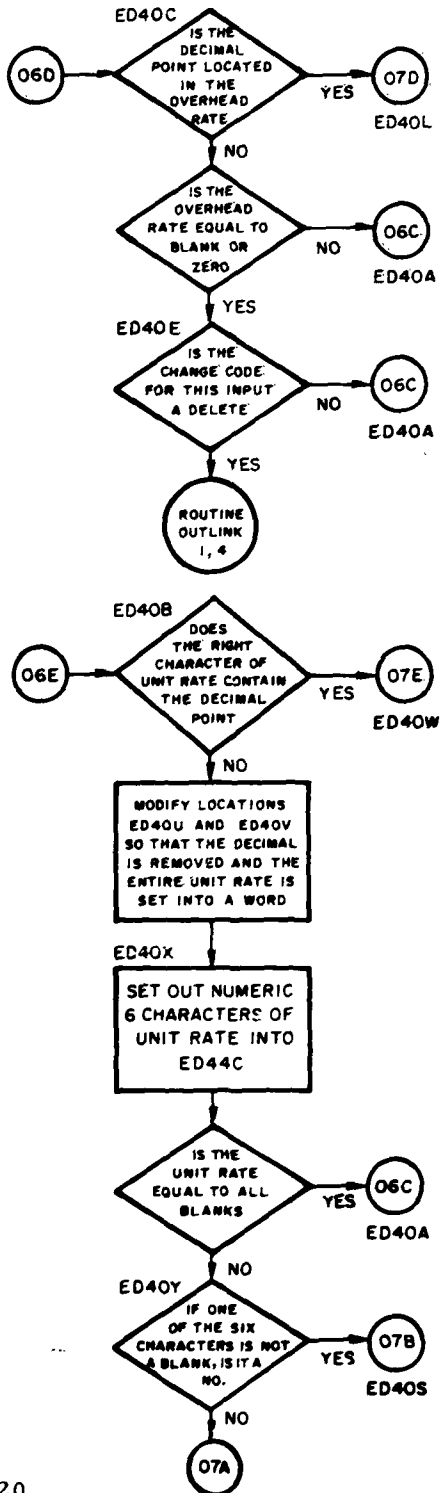
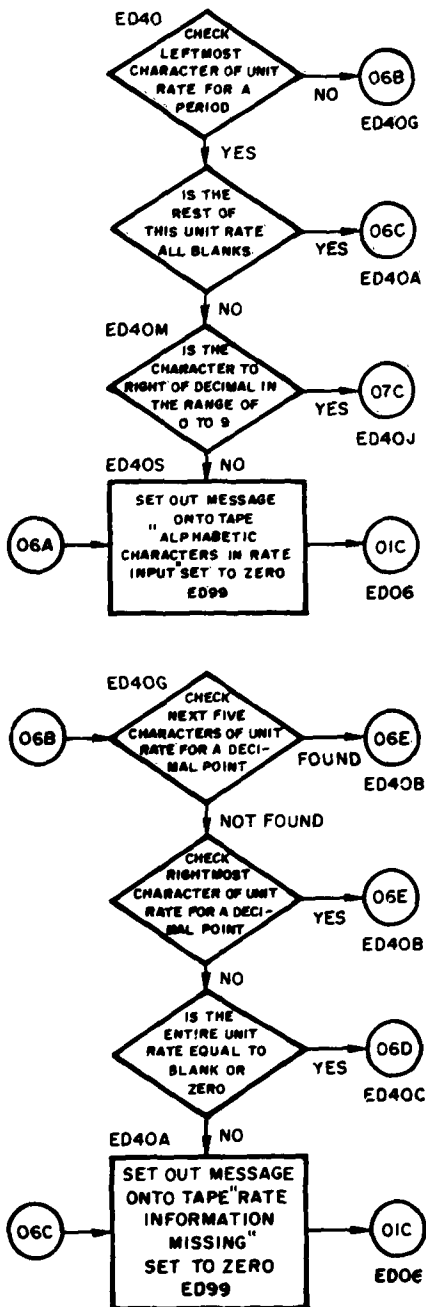
## ED33 CHECK YEAR FIELD FOR VALIDITY



## ED38 CHECK QUARTER FIELD FOR VALIDITY

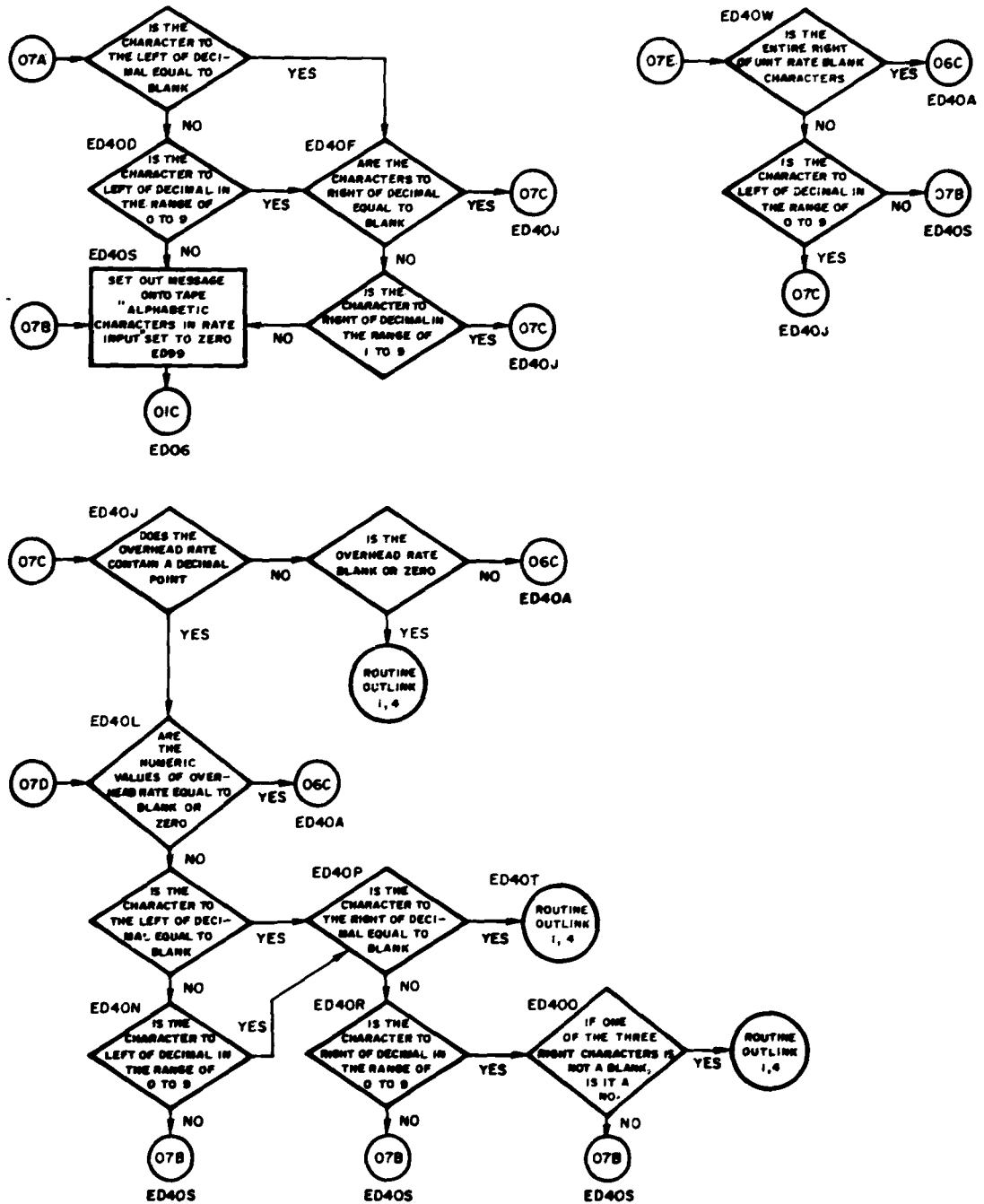


ED40 CHECK UNIT AND  
OVERHEAD RATES FOR  
VALIDITY



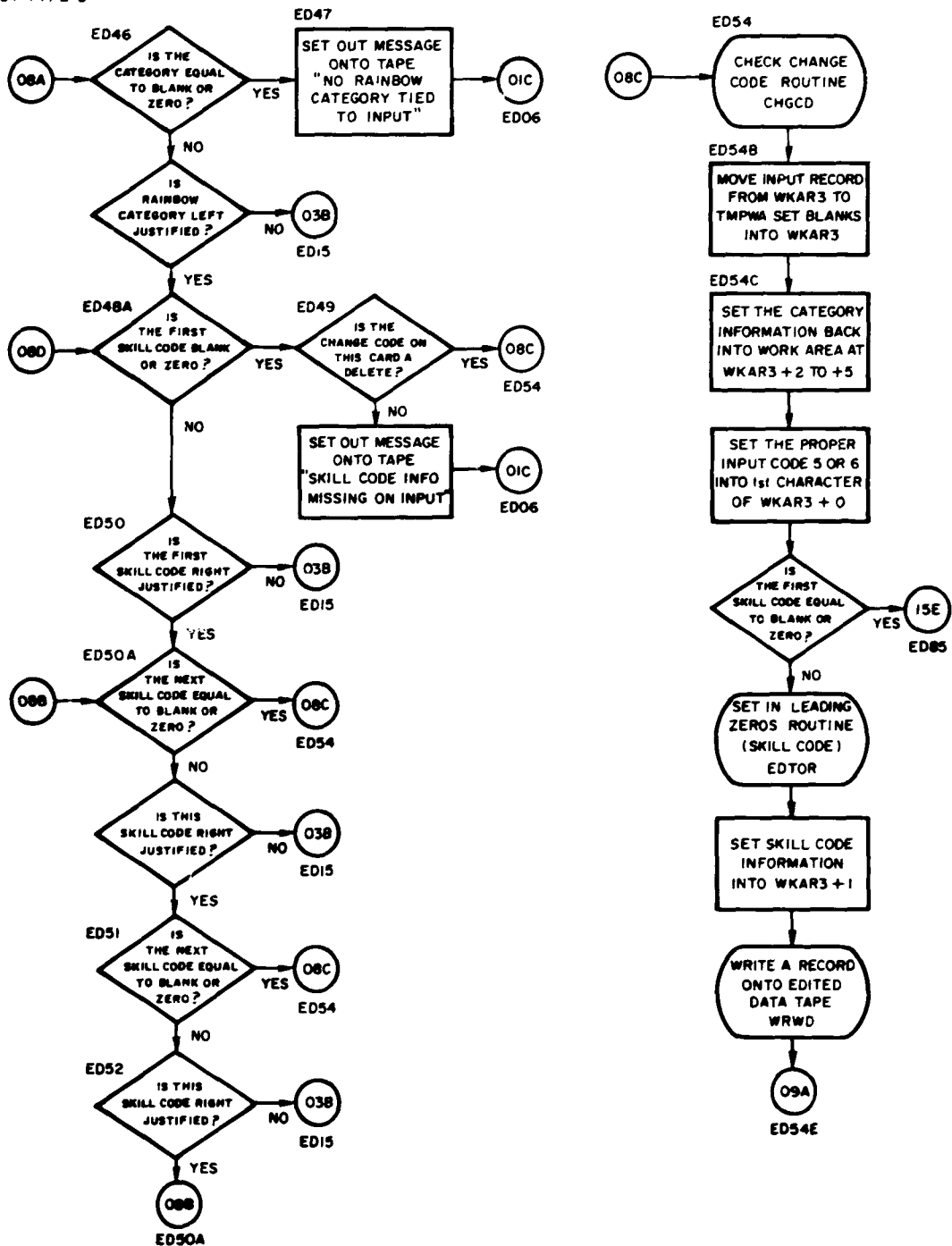
REGION EDIT

ED 40 (CONT)

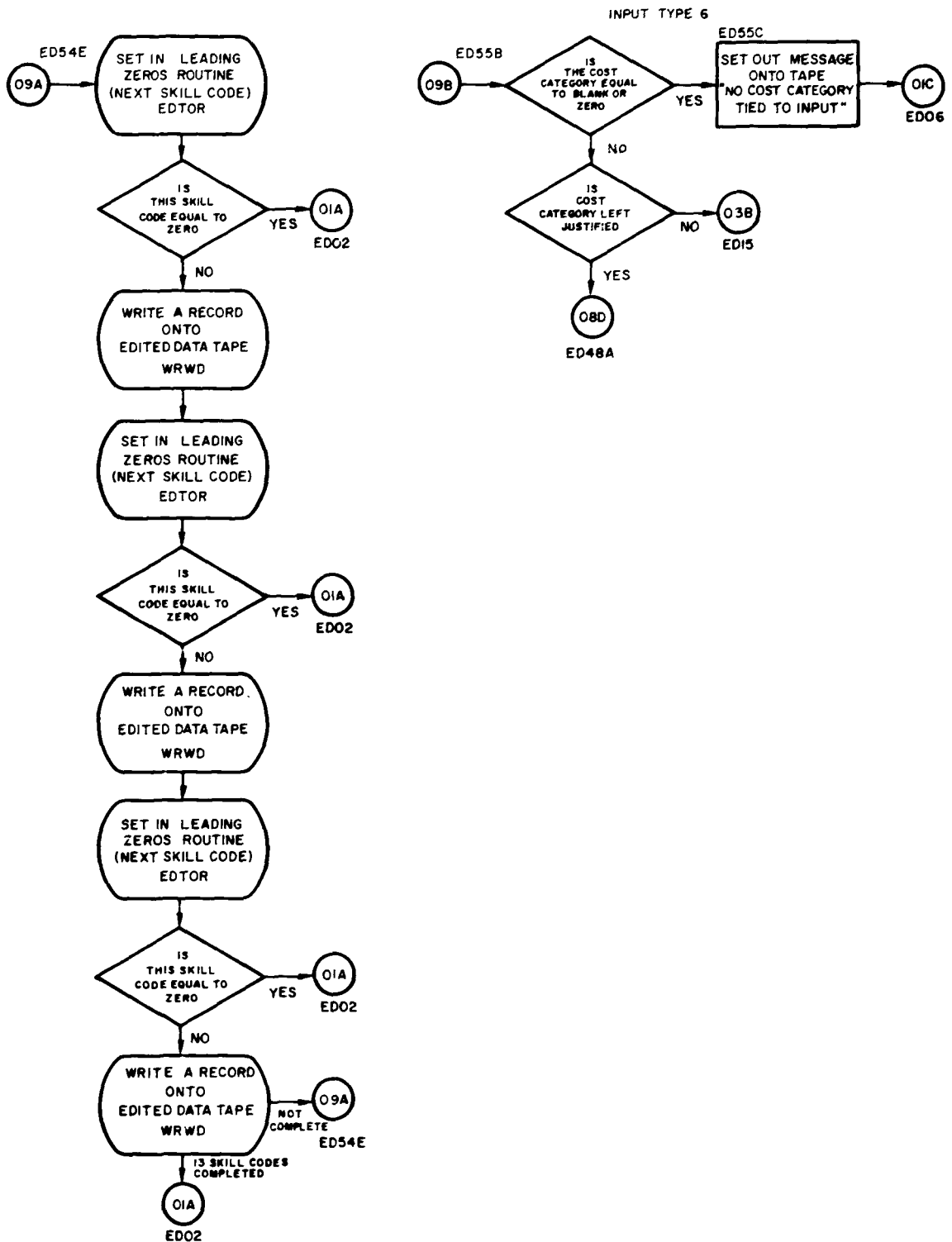


# REGION EDIT

INPUT TYPE 5

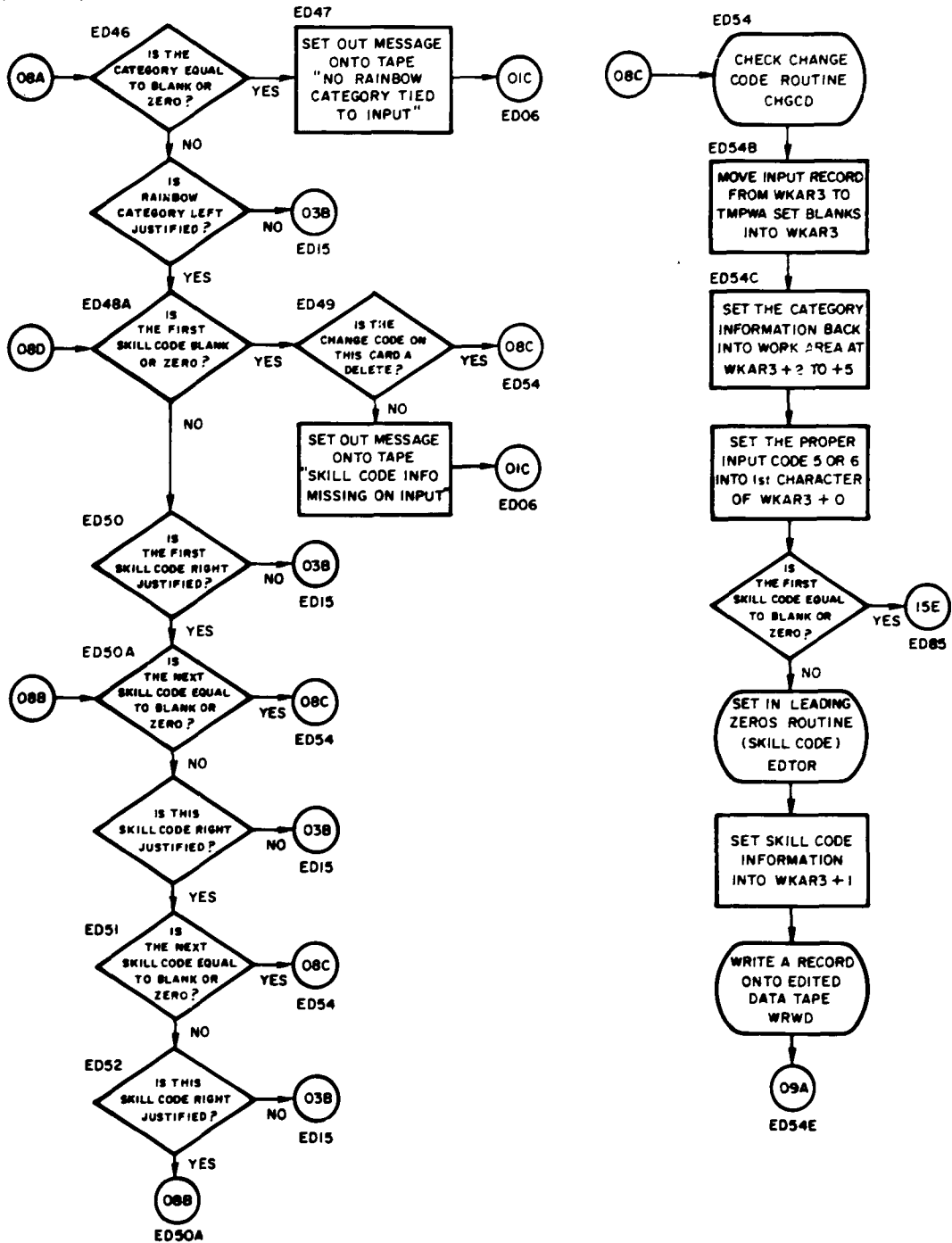


# REGION EDIT



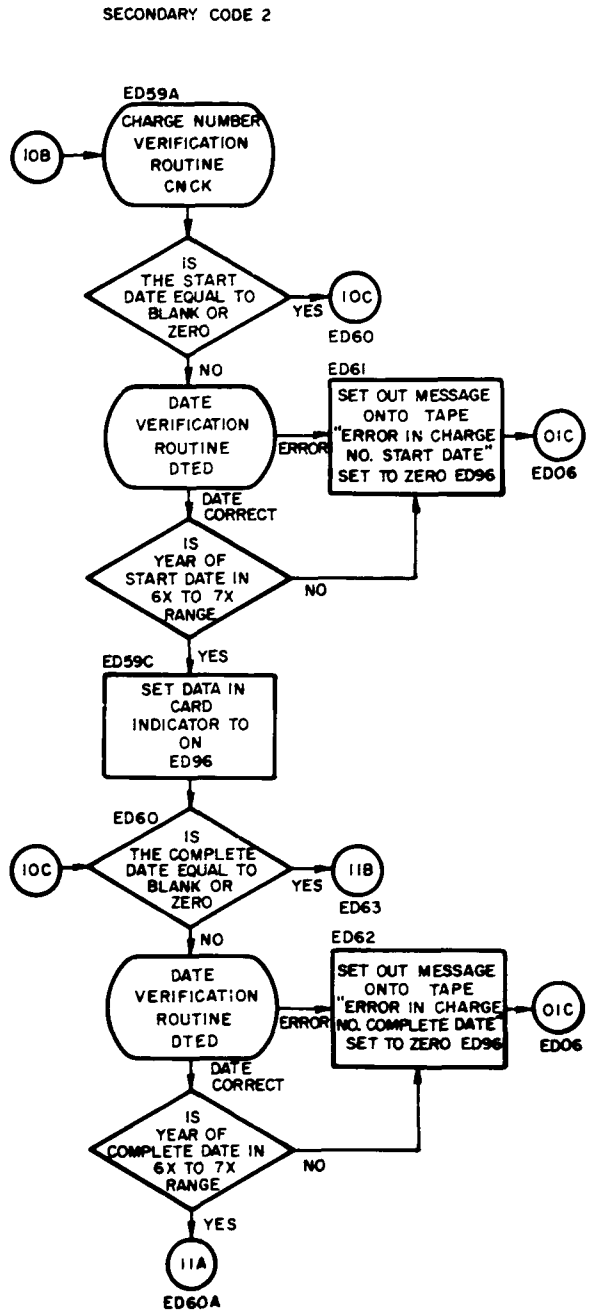
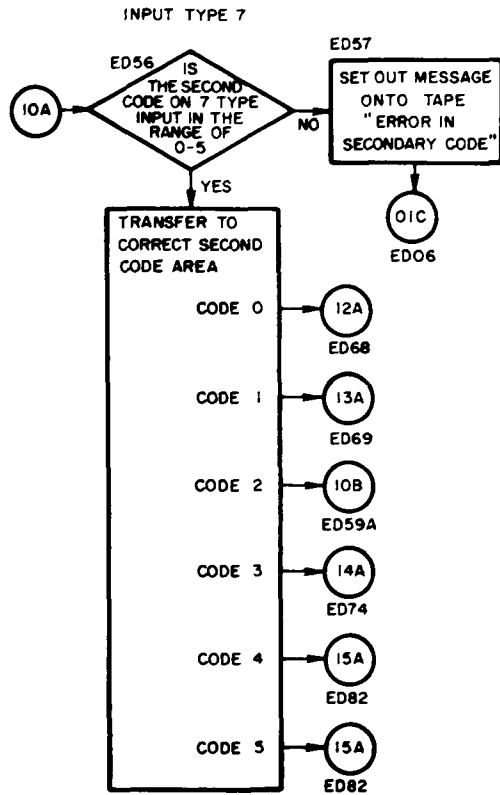
# REGION EDIT

INPUT TYPE 5

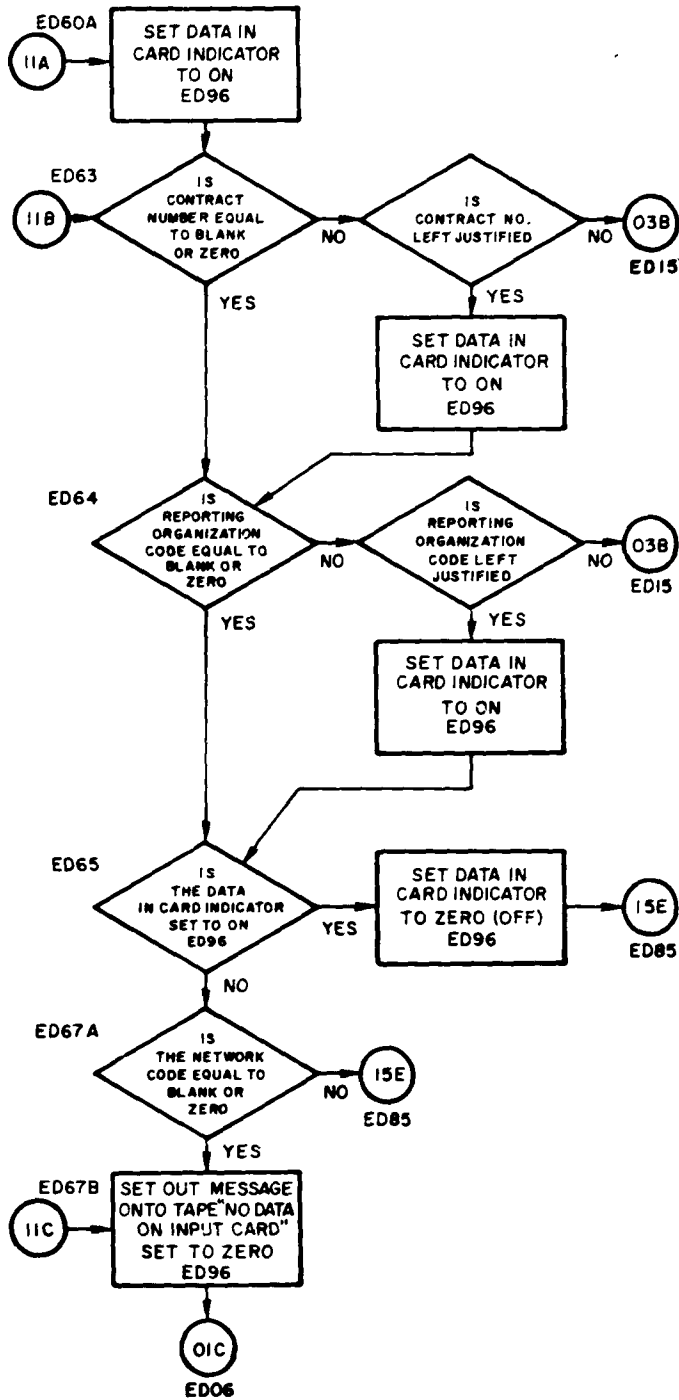




# REGION EDIT

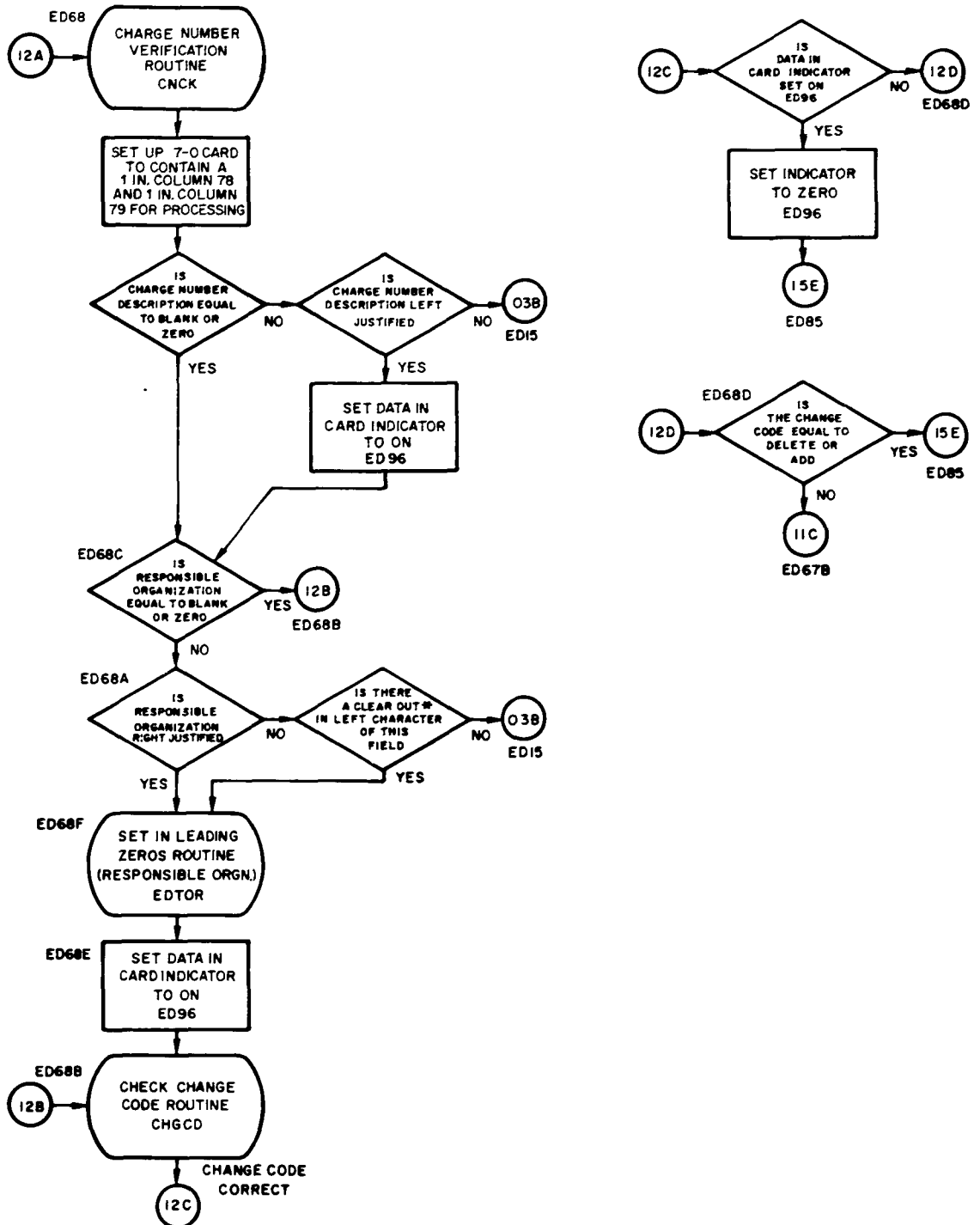


# REGION EDIT



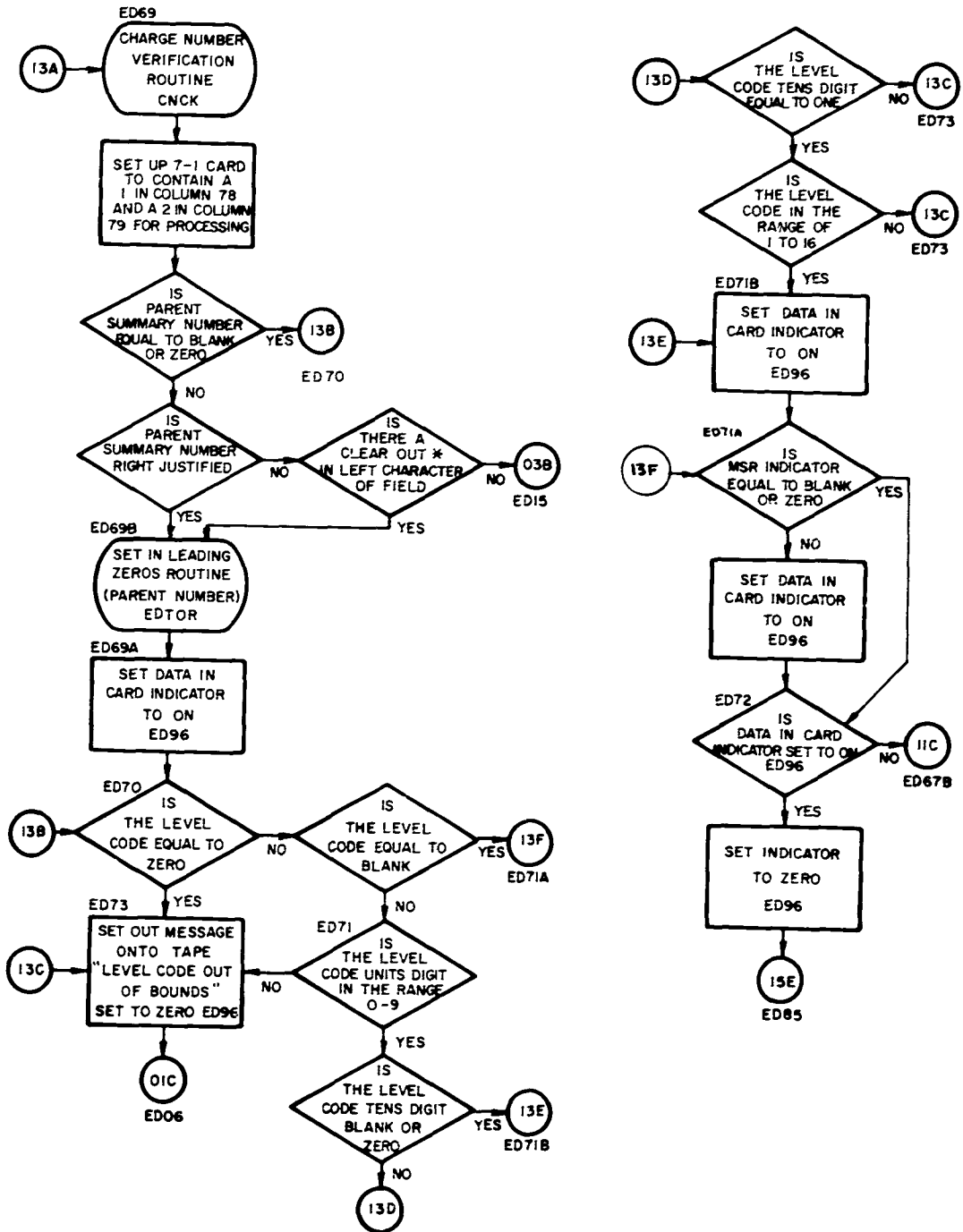
# REGION EDIT

SECONDARY CODE 0



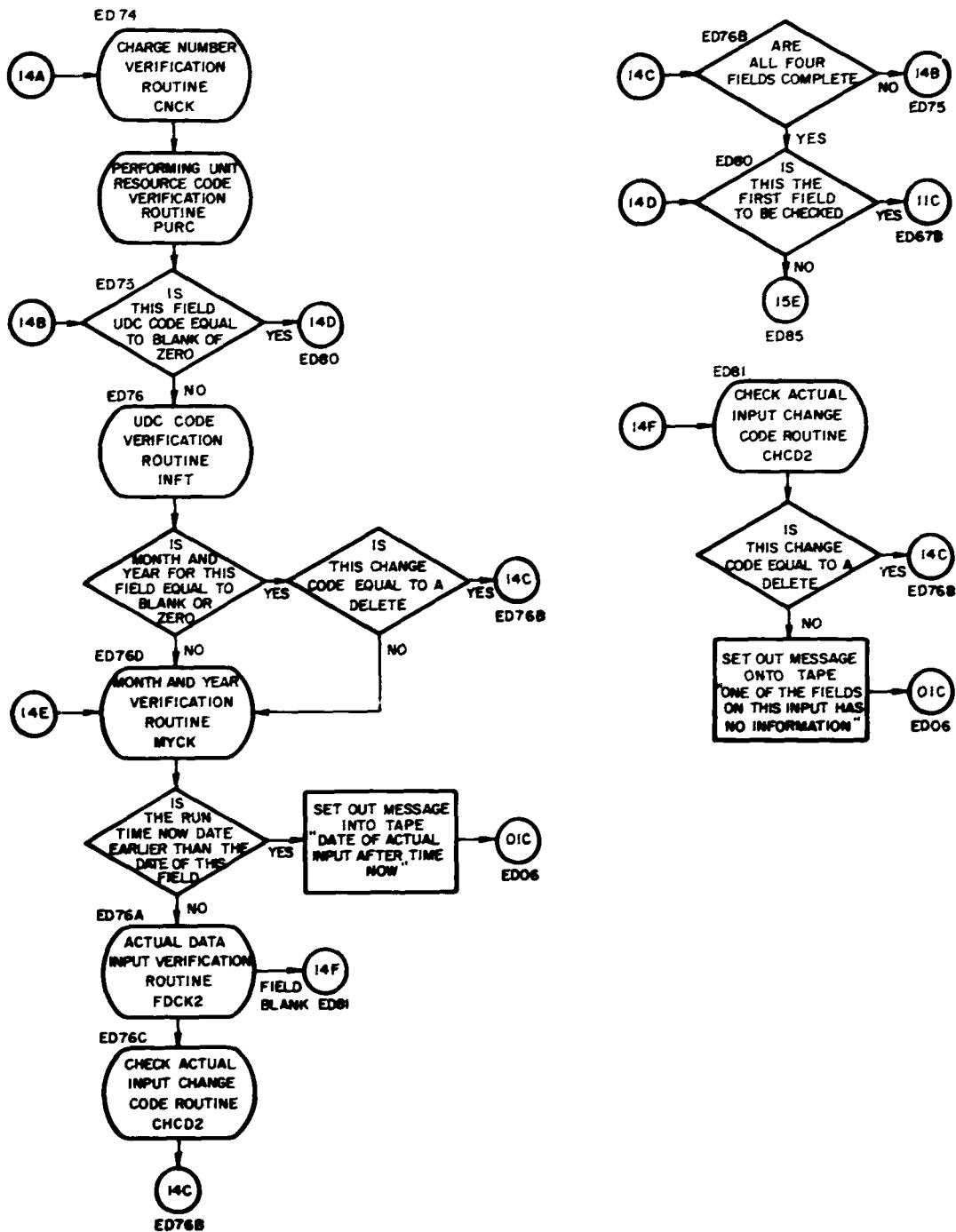
# REGION EDIT

SECONDARY CODE I



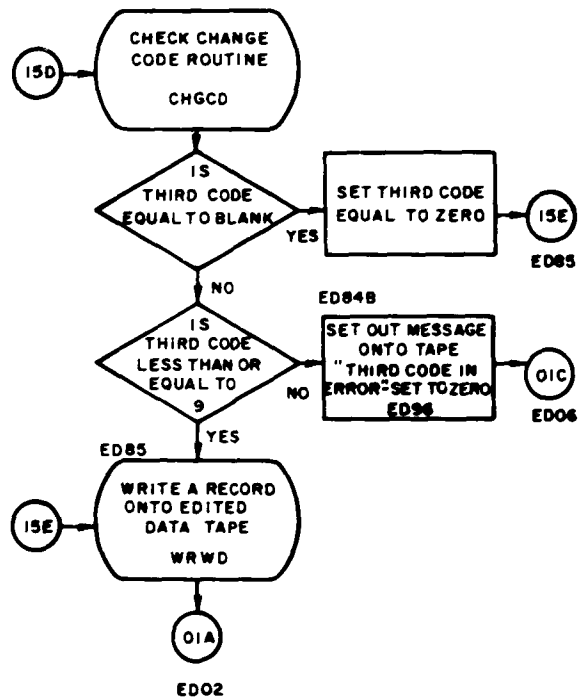
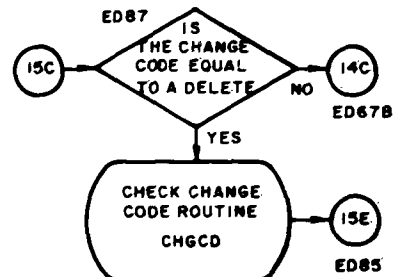
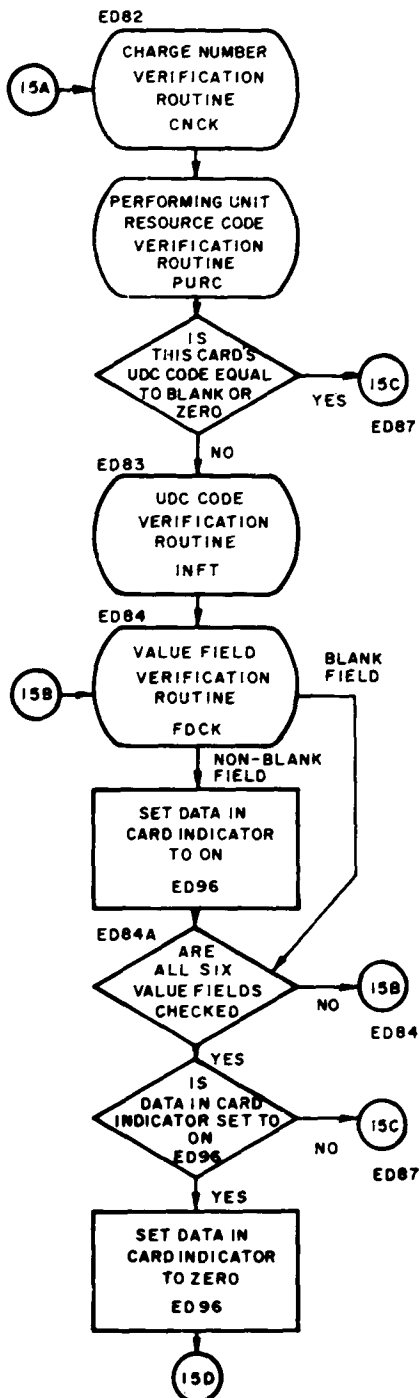
# REGION EDIT

## SECONDARY CODE 3



# REGION EDIT

## SECONDARY CODE 4 AND 5



Region CNCK

**EXPLANATION OF REGION:**

This routine will edit and verify the charge number on the input data cards.

**CALLING SEQUENCE:**

L       TSX       CNCK, 4

L + 1    Normal return

**INPUT:**

Charge number starting in the 2nd character of WKAR3 and running for 18 characters

**OUTPUT:**

An edited charge number in WKAR3

**STORAGE USED:**

Not applicable

**SUBREGIONS AND SUBROUTINES USED:**

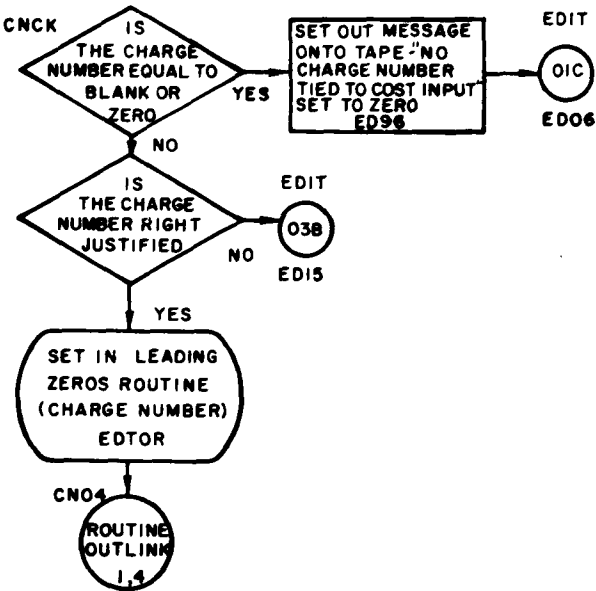
EDITOR

**EXPLANATION OF CALLING SEQUENCE:**

If an error is found the input is set out on the SYSTEM ERROR TAPE with an accompanying message

REGION CNCK

CHARGE NUMBER CHECK  
ROUTINE





Region DTED

EXPLANATION OF REGION:

This routine will check the dates (DDMMYY) in the input cards verifying months, days in range specified by months, and alphabetic characters in year or days.

CALLING SEQUENCE:

L       TSX       DTED, 4  
L + 1    Error return  
L + 2    Normal return

INPUT:

The date will come into this routine as XXXXDD in the accumulator and MMMYYX in the MQ.

OUTPUT:

Not applicable

STORAGE USED:

The DTTB and DTTB2 tables which are part of the DTCR subroutine explained in section III-C.

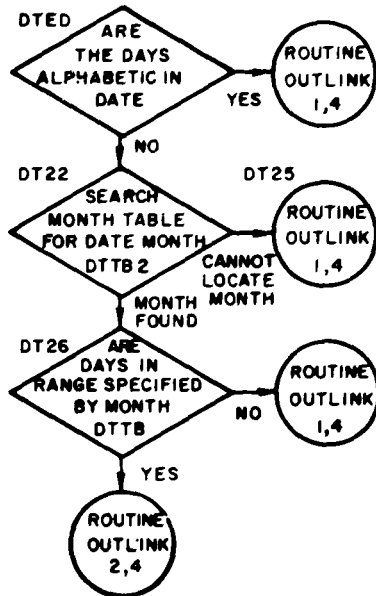
SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

Not applicable

DATE EDIT  
ROUTINE



Region PURC

EXPLANATION OF REGION:

This routine will edit the performing unit and resource code for the 7 card inputs where required.

CALLING SEQUENCE:

L       TSX       PURC, 4  
L + 1    Normal return

INPUT:

Performing unit starting in the 20th character of WKAR3 and running for 6 characters. Resource code starting in the 26th character of WKAR3 and running for 4 characters.

OUTPUT:

An edited performing unit and resource code in WKAR3.

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

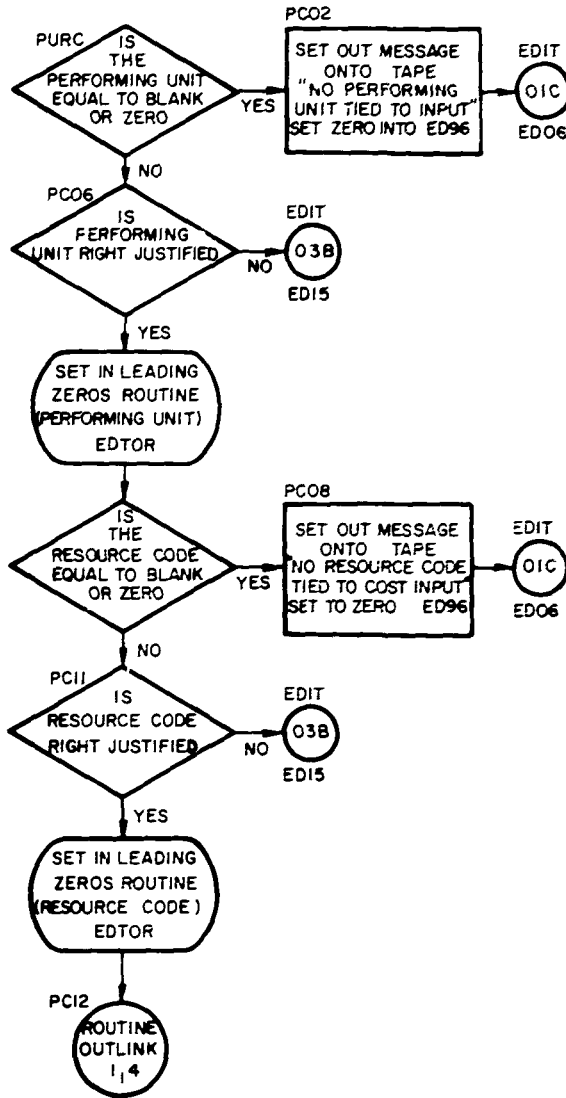
EDITOR

EXPLANATION OF CALLING SEQUENCE:

If an error is found the input is set out on the SYSTEM ERROR TAPE with an accompanying message.

REGION PURC

PERFORMING UNIT  
RESOURCE CODE  
CHECK ROUTINE



Region INFT

EXPLANATION OF REGION:

This routine will verify the UDC code for the following codes:  
H, D, M, T, and U.

CALLING SEQUENCE:

L       TSX       INFT, 4  
L + 1    Normal return

INPUT:

The UDC code right-justified in the accumulator.

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

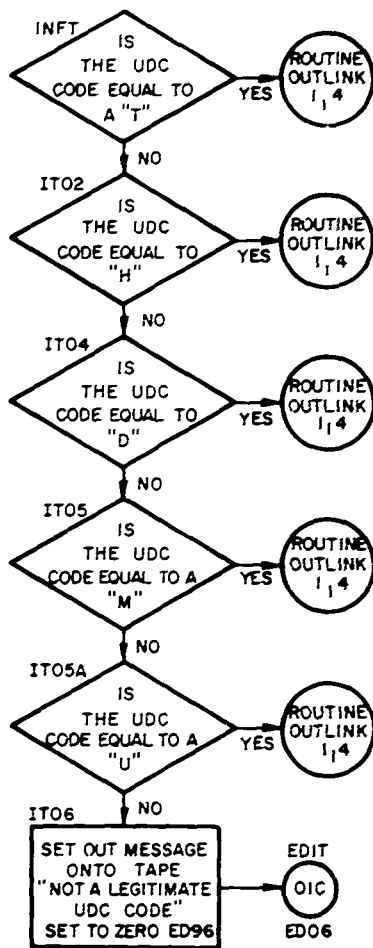
Not applicable

EXPLANATION OF CALLING SEQUENCE:

If an error is found, the input is set out on the SYSTEM ERROR TAPE  
with an accompanying message.

# REGION INFT

## UDC CODE VERIFICATION ROUTINE



Region MYCK

EXPLANATION OF REGION:

This routine will check the month and year for cost inputs (7-3 cards).

CALLING SEQUENCE:

L       TSX       MYCK, 4

L + 1    Normal return

INPUT:

The month and year will come into this routine, right-justified, in the accumulator as XXMMYY.

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

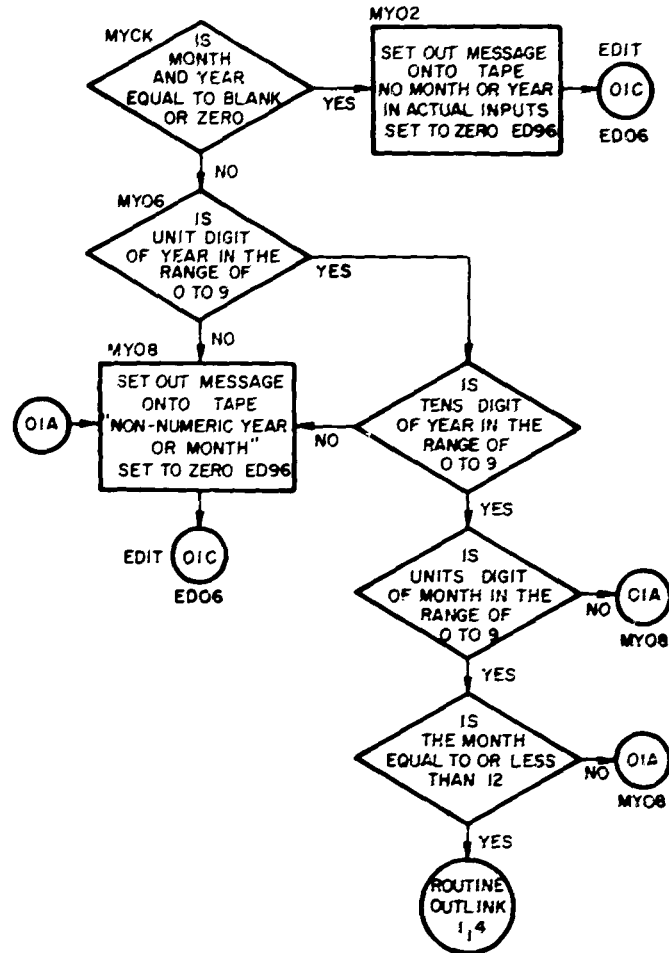
SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

If an error is found the input is set out on the SYSTEM ERROR TAPE with an accompanying message.

MONTH AND YEAR  
CHECK ROUTINE





Region FDCK

**EXPLANATION OF REGION:**

This routine will check the value fields for the 7-4 and 7-5 card inputs.

**CALLING SEQUENCE:**

L       TSX       FDCK, 4  
L + 1    Return if field is blank  
L + 2    Normal return

**INPUT:**

The value field will be 6 characters, and is set up in the accumulator.

**OUTPUT:**

Not applicable

**STORAGE USED:**

Not applicable

**SUBREGIONS AND SUBROUTINES USED:**

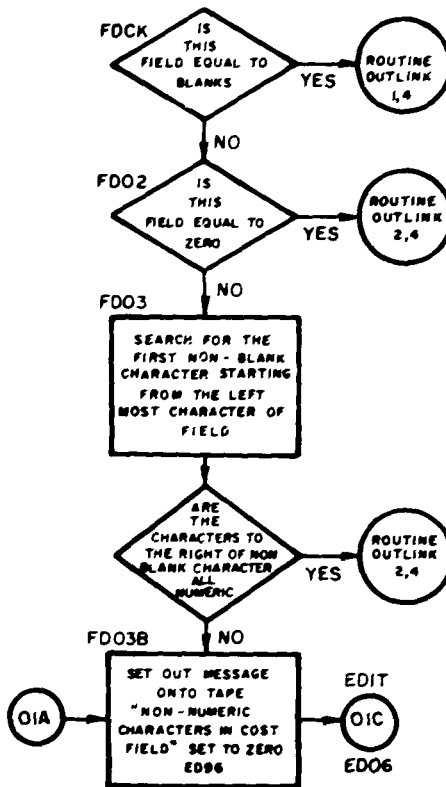
Not applicable

**EXPLANATION OF CALLING SEQUENCE:**

If an error is found, the input is set out on the SYSTEM ERROR TAPE with an accompanying message.

# REGION FOCK

VALUE FIELD CHECK  
ROUTINE FOR 7-4  
AND 7-5 INPUTS



### Region FDCK2

#### EXPLANATION OF REGION:

This routine will check the value fields for the 7-3 card inputs allowing for (-) signs in the leftmost character of field.

#### CALLING SEQUENCE:

L        TSX        FDCK2, 4  
L + 1    Return if field is blank  
L + 2    Normal return

#### INPUT:

The value field will be 6 characters, and is set up in the accumulator.

#### OUTPUT:

Not applicable

#### STORAGE USED:

Not applicable

#### SUBREGIONS AND SUBROUTINES USED:

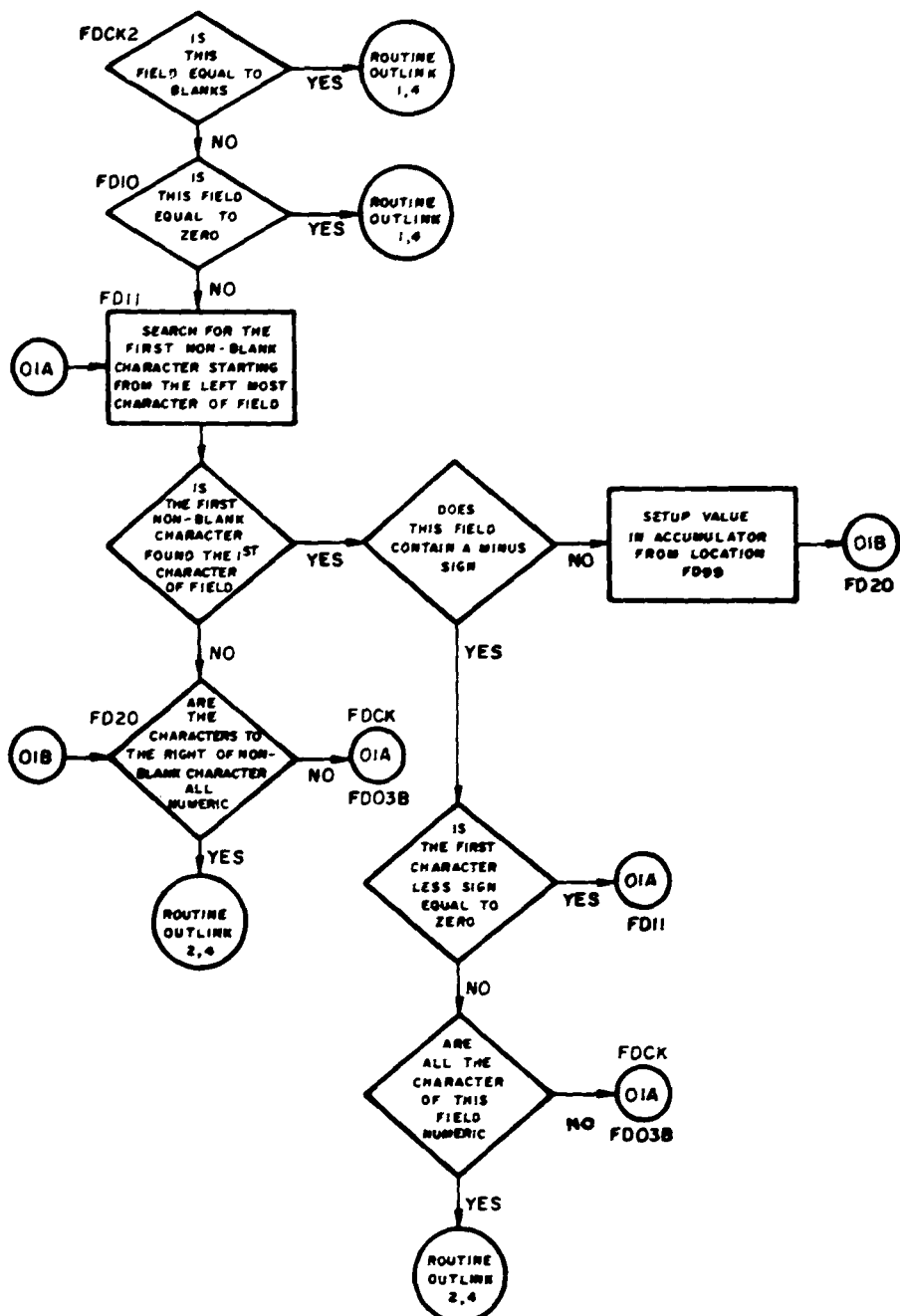
Not applicable

#### EXPLANATION OF CALLING SEQUENCE:

If an error is found, the input is set out on the SYSTEM ERROR TAPE with an accompanying message.

REGION FDCK2

VALUE FIELD CHECK  
ROUTINE FOR 7-3  
INPUTS



Region CHCD2

**EXPLANATION OF REGION:**

This routine will check the second class of change code associated with 7-3 type input. These codes are R, T, and D.

**CALLING SEQUENCE:**

L       TSX       CHCD2, 4  
L + 1    Normal return

**INPUT:**

Not applicable--tied to 7-3 input card.

**OUTPUT:**

Not applicable

**STORAGE USED:**

Not applicable

**SUBREGIONS AND SUBROUTINES USED:**

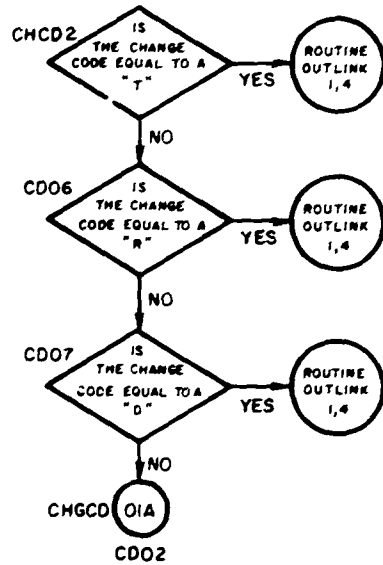
Not applicable

**EXPLANATION OF CALLING SEQUENCE:**

If an error is found, the input is set out on the SYSTEM ERROR TAPE with an accompanying message.

REGION CHCD2

ACTUAL INPUT  
CHANGE CODE  
VERIFICATION  
ROUTINE



### Region EOFIT

#### EXPLANATION OF REGION:

END-OF-FILE EXIT for wrapping up the PERT COST EDIT portion of program. The writing of the E.O.F.'s, the rewinding and unloading of tapes, as indicated by the option, as well as setting up the messages for the end of the edit phase are accomplished in this routine.

#### CALLING SEQUENCE:

L        TRA        EOFIT

Outlink TRA to EDIT ROUTINE EXIT

#### INPUT:

Not applicable

#### OUTPUT:

Number of errors message set out on on-line printer plus accompanying information as described on Page III-D-1.

#### STORAGE USED:

Not applicable

#### SUBREGIONS AND SUBROUTINES USED:

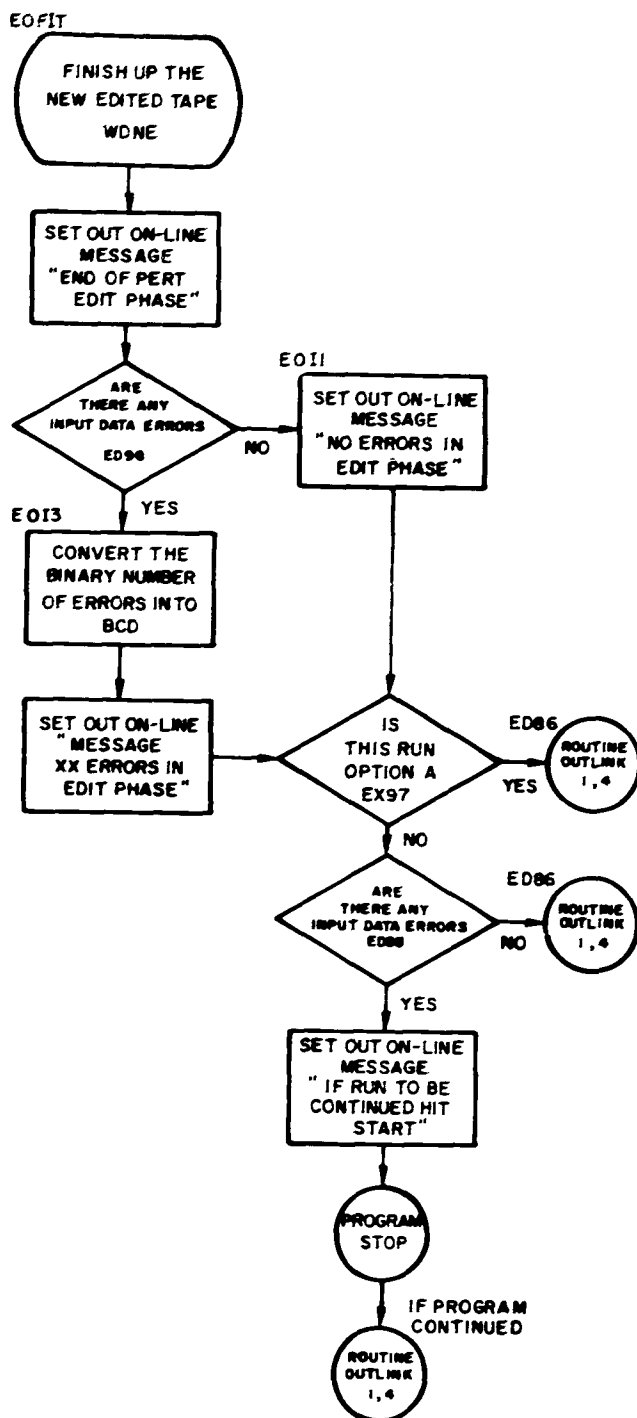
WDNE (See Section III-B) to finish up EDITED DATA TAPE

#### EXPLANATION OF CALLING SEQUENCE:

Not applicable

# REGION EOFIT

END OF FILE ON  
INPUT TAPE





### Region CHGCD

#### EXPLANATION OF REGION:

This routine will check the major type of change code associated with the input cards. These codes are A, C, and D.

#### CALLING SEQUENCE:

L       TSX       CHGCD, 4  
L + 1    Normal return

#### INPUT:

Code will always be set in column 80 of card and for this routine will be the 80th character in WKAR3.

#### OUTPUT:

Any D code located will be set to a B in the 80th character of WKAR3 for sorting convenience.

#### STORAGE USED:

Not applicable

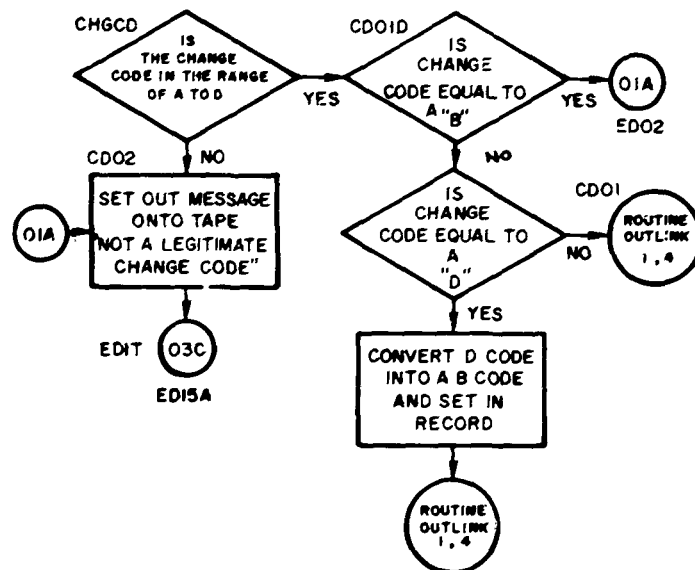
#### SUBREGIONS AND SUBROUTINES USED:

Not applicable

#### EXPLANATION OF CALLING SEQUENCE:

If an error is found, the input is set out on the SYSTEM ERROR TAPE with an accompanying message.

CHANGE CODE  
VERIFICATION  
ROUTINE



### Region EDTOR

#### EXPLANATION OF REGION:

This routine will set up leading zeros for all fields described on Page III-D-12.

#### CALLING SEQUENCE:

L       TSX       EDTOR, 4  
L + 1    This word of field is all blank  
L + 2    Normal return--field does not contain all blank

#### INPUT:

The leftmost word of the field to be edited, followed by the word at its right, until a non-blank is found. For each word the routine will have to be entered again. If the first word is less than 6 characters, blanks should be set into the leftmost characters, which are not contained in the field to be checked.

#### OUTPUT:

For each word of the field entered, the leftmost blanks will be converted to zeros.

#### STORAGE USED:

Not applicable

#### SUBREGIONS AND SUBROUTINES USED:

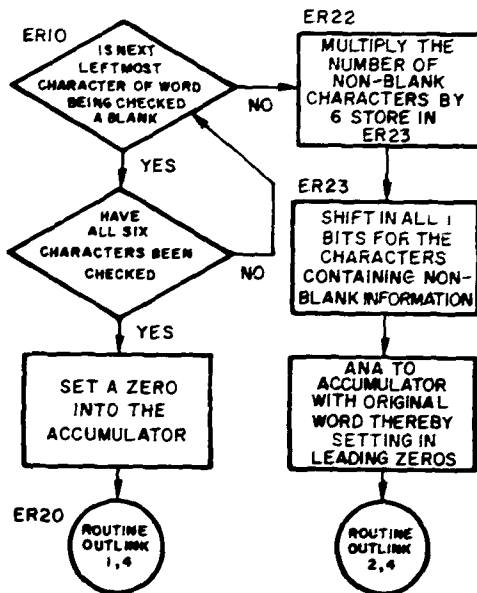
Not applicable

#### EXPLANATION OF CALLING SEQUENCE:

Not applicable

# REGION EDITOR

TO SET IN LEADING  
ZEROS ROUTINE



### Input Edit Tape and Card Layouts

The following section will show pictorially the various tape layouts involved in the edit phase as well as the layout for the input data cards (except for the input parameter cards which will be explained in Section III-F.

All input cards can be set onto the INPUT DATA TAPE in a random order except for the label, which must be first. The edit sort phase will set the cards in the proper order. The layout on the INPUT DATA TAPE will take the following form:

|                                                                                                                                             |                            |                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------|
| Label                                                                                                                                       | UNSORTED RAW DATA TAPE     | Each of the records on this tape, other than the end-of-record gaps, will be 14 words long. |
| The control card or cards are only set on one of the UNSORTED RAW DATA TAPES, and there can be one or many control cards set onto this tape | End-of-record gap          |                                                                                             |
|                                                                                                                                             | "A" Control Card           |                                                                                             |
|                                                                                                                                             | End-of-record gap          |                                                                                             |
|                                                                                                                                             |                            |                                                                                             |
|                                                                                                                                             | Last Control Card (if any) |                                                                                             |
|                                                                                                                                             | End-of-record gap          |                                                                                             |
|                                                                                                                                             | First data input           |                                                                                             |
|                                                                                                                                             | End-of-record gap          |                                                                                             |
|                                                                                                                                             | Next data input            |                                                                                             |
|                                                                                                                                             | End-of-record gap          |                                                                                             |
|                                                                                                                                             |                            |                                                                                             |
|                                                                                                                                             | Last data input            |                                                                                             |
|                                                                                                                                             | End-of-record gap          |                                                                                             |
|                                                                                                                                             | End-of-file gap            |                                                                                             |

|       |                      |
|-------|----------------------|
| Label | ACTUAL RAW DATA TAPE |
|       | End-of-record gap    |
|       | First data input     |
|       | End-of-record gap    |
|       | Next data input      |
|       | End-of-record gap    |

|                   |
|-------------------|
| End-of-record gap |
| Last data input   |
| End-of-record gap |
| End-of-file gap   |

These tapes will be created as a result of a card-to-tape or tape-to-tape operation.

The EDITED DATA TAPE will be developed by passing the INPUT DATA TAPES through the edit phase. This EDITED DATA TAPE may be longer than its corresponding INPUT DATA TAPE due to the breakdown of the 5 and 6 card inputs as explained on Page III-D-11. The EDITED DATA TAPE can be used as an INPUT DATA TAPE in the case where a previous edit pass has been corrected and the program is started again. The layout on the EDITED DATA TAPE will take the following form:

|                                                                                                                                                                                                                                                                                 |                                  |                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <p>These control cards will be set only on the first EDITED DATA TAPE and will consist of the latest control card set. There can be one or many control cards set on this tape.</p> <p>The first and last indications to edited data input refer only to this physical tape</p> | EDITED RAW DATA TAPE DDMMYY TPE* | 6 words long                                                                                                                     |
|                                                                                                                                                                                                                                                                                 | End-of-record gap                |                                                                                                                                  |
|                                                                                                                                                                                                                                                                                 | (Program name)                   | 4 words long                                                                                                                     |
|                                                                                                                                                                                                                                                                                 | End-of-record gap                |                                                                                                                                  |
|                                                                                                                                                                                                                                                                                 | "A" Control Card                 |                                                                                                                                  |
|                                                                                                                                                                                                                                                                                 | End-of-record gap                |                                                                                                                                  |
|                                                                                                                                                                                                                                                                                 | Last Control Card (if any)       |                                                                                                                                  |
|                                                                                                                                                                                                                                                                                 | End-of-record gap                |                                                                                                                                  |
|                                                                                                                                                                                                                                                                                 | First edited data input          | Each of the records below the label, other than the end-of-record gaps, will be 14 words long because a checksum has been added. |
|                                                                                                                                                                                                                                                                                 | End-of-record gap                |                                                                                                                                  |
|                                                                                                                                                                                                                                                                                 | Next edited data input           |                                                                                                                                  |
|                                                                                                                                                                                                                                                                                 | End-of-record gap                |                                                                                                                                  |
|                                                                                                                                                                                                                                                                                 | Last edited data input           |                                                                                                                                  |
|                                                                                                                                                                                                                                                                                 | End-of-record gap                |                                                                                                                                  |
|                                                                                                                                                                                                                                                                                 | End-of-file gap                  | **                                                                                                                               |
|                                                                                                                                                                                                                                                                                 | End-of-file gap                  |                                                                                                                                  |

\*The EDITED DATA TAPE will have a 1 indicating it was the first tape

created of this series. All the following tapes created, if any, will be numbered consecutively from 2 to 9.

\*\*The configuration shown represents the last tape of a series. If it is not the last tape of a series, an additional record of one word is inserted between the two end-of-file gaps as explained on Page III-B-10.

Figure III-D-1 is the input data card layouts. Table III-D-1 shows the input coding assignments.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 | 239 | 240 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 | 256 | 257 | 258 | 259 | 260 | 261 | 262 | 263 | 264 | 265 | 266 | 267 | 268 | 269 | 270 | 271 | 272 | 273 | 274 | 275 | 276 | 277 | 278 | 279 | 280 | 281 | 282 | 283 | 284 | 285 | 286 | 287 | 288 | 289 | 290 | 291 | 292 | 293 | 294 | 295 | 296 | 297 | 298 | 299 | 300 | 301 | 302 | 303 | 304 | 305 | 306 | 307 | 308 | 309 | 310 | 311 | 312 | 313 | 314 | 315 | 316 | 317 | 318 | 319 | 320 | 321 | 322 | 323 | 324 | 325 | 326 | 327 | 328 | 329 | 330 | 331 | 332 | 333 | 334 | 335 | 336 | 337 | 338 | 339 | 340 | 341 | 342 | 343 | 344 | 345 | 346 | 347 | 348 | 349 | 350 | 351 | 352 | 353 | 354 | 355 | 356 | 357 | 358 | 359 | 360 | 361 | 362 | 363 | 364 | 365 | 366 | 367 | 368 | 369 | 370 | 371 | 372 | 373 | 374 | 375 | 376 | 377 | 378 | 379 | 380 | 381 | 382 | 383 | 384 | 385 | 386 | 387 | 388 | 389 | 390 | 391 | 392 | 393 | 394 | 395 | 396 | 397 | 398 | 399 | 400 | 401 | 402 | 403 | 404 | 405 | 406 | 407 | 408 | 409 | 410 | 411 | 412 | 413 | 414 | 415 | 416 | 417 | 418 | 419 | 420 | 421 | 422 | 423 | 424 | 425 | 426 | 427 | 428 | 429 | 430 | 431 | 432 | 433 | 434 | 435 | 436 | 437 | 438 | 439 | 440 | 441 | 442 | 443 | 444 | 445 | 446 | 447 | 448 | 449 | 450 | 451 | 452 | 453 | 454 | 455 | 456 | 457 | 458 | 459 | 460 | 461 | 462 | 463 | 464 | 465 | 466 | 467 | 468 | 469 | 470 | 471 | 472 | 473 | 474 | 475 | 476 | 477 | 478 | 479 | 480 | 481 | 482 | 483 | 484 | 485 | 486 | 487 | 488 | 489 | 490 | 491 | 492 | 493 | 494 | 495 | 496 | 497 | 498 | 499 | 500 | 501 | 502 | 503 | 504 | 505 | 506 | 507 | 508 | 509 | 510 | 511 | 512 | 513 | 514 | 515 | 516 | 517 | 518 | 519 | 520 | 521 | 522 | 523 | 524 | 525 | 526 | 527 | 528 | 529 | 530 | 531 | 532 | 533 | 534 | 535 | 536 | 537 | 538 | 539 | 540 | 541 | 542 | 543 | 544 | 545 | 546 | 547 | 548 | 549 | 550 | 551 | 552 | 553 | 554 | 555 | 556 | 557 | 558 | 559 | 560 | 561 | 562 | 563 | 564 | 565 | 566 | 567 | 568 | 569 | 570 | 571 | 572 | 573 | 574 | 575 | 576 | 577 | 578 | 579 | 580 | 581 | 582 | 583 | 584 | 585 | 586 | 587 | 588 | 589 | 590 | 591 | 592 | 593 | 594 | 595 | 596 | 597 | 598 | 599 | 600 | 601 | 602 | 603 | 604 | 605 | 606 | 607 | 608 | 609 | 610 | 611 | 612 | 613 | 614 | 615 | 616 | 617 | 618 | 619 | 620 | 621 | 622 | 623 | 624 | 625 | 626 | 627 | 628 | 629 | 630 | 631 | 632 | 633 | 634 | 635 | 636 | 637 | 638 | 639 | 640 | 641 | 642 | 643 | 644 | 645 | 646 | 647 | 648 | 649 | 650 | 651 | 652 | 653 | 654 | 655 | 656 | 657 | 658 | 659 | 660 | 661 | 662 | 663 | 664 | 665 | 666 | 667 | 668 | 669 | 670 | 671 | 672 | 673 | 674 | 675 | 676 | 677 | 678 | 679 | 680 | 681 | 682 | 683 | 684 | 685 | 686 | 687 | 688 | 689 | 690 | 691 | 692 | 693 | 694 | 695 | 696 | 697 | 698 | 699 | 700 | 701 | 702 | 703 | 704 | 705 | 706 | 707 | 708 | 709 | 710 | 711 | 712 | 713 | 714 | 715 | 716 | 717 | 718 | 719 | 720 | 721 | 722 | 723 | 724 | 725 | 726 | 727 | 728 | 729 | 730 | 731 | 732 | 733 | 734 | 735 | 736 | 737 | 738 | 739 | 740 | 741 | 742 | 743 | 744 | 745 | 746 | 747 | 748 | 749 | 750 | 751 | 752 | 753 | 754 | 755 | 756 | 757 | 758 | 759 | 760 | 761 | 762 | 763 | 764 | 765 | 766 | 767 | 768 | 769 | 770 | 771 | 772 | 773 | 774 | 775 | 776 | 777 | 778 | 779 | 780 | 781 | 782 | 783 | 784 | 785 | 786 | 787 | 788 | 789 | 790 | 791 | 792 | 793 | 794 | 795 | 796 | 797 | 798 | 799 | 800 | 801 | 802 | 803 | 804 | 805 | 806 | 807 | 808 | 809 | 810 | 811 | 812 | 813 | 814 | 815 | 816 | 817 | 818 | 819 | 820 | 821 | 822 | 823 | 824 | 825 | 826 | 827 | 828 | 829 | 830 | 831 | 832 | 833 | 834 | 835 | 836 | 837 | 838 | 839 | 840 | 841 | 842 | 843 | 844 | 845 | 846 | 847 | 848 | 849 | 850 | 851 | 852 | 853 | 854 | 855 | 856 | 857 | 858 | 859 | 860 | 861 | 862 | 863 | 864 | 865 | 866 | 867 | 868 | 869 | 870 | 871 | 872 | 873 | 874 | 875 | 876 | 877 | 878 | 879 | 880 | 881 | 882 | 883 | 884 | 885 | 886 | 887 | 888 | 889 | 890 | 891 | 892 | 893 | 894 | 895 | 896 | 897 | 898 | 899 | 900 | 901 | 902 | 903 | 904 | 905 | 906 | 907 | 908 | 909 | 910 | 911 | 912 | 913 | 914 | 915 | 916 | 917 | 918 | 919 | 920 | 921 | 922 | 923 | 924 | 925 | 926 | 927 | 928 | 929 | 930 | 931 | 932 | 933 | 934 | 935 | 936 | 937 | 938 | 939 | 940 | 941 | 942 | 943 | 944 | 945 | 946 | 947 | 948 | 949 | 950 | 951 | 952 | 953 | 954 | 955 | 956 | 957 | 958 | 959 | 960 | 961 | 962 | 963 | 964 | 965 | 966 | 967 | 968 | 969 | 970 | 971 | 972 | 973 | 974 | 975 | 976 | 977 | 978 | 979 | 980 | 981 | 982 | 983 | 984 | 985 | 986 | 987 | 988 | 989 | 990 | 991 | 992 | 993 | 994 | 995 | 996 | 997 | 998 | 999 | 1000 | 1001 | 1002 | 1003 | 1004 | 1005 | 1006 | 1007 | 1008 | 1009 | 1010 | 1011 | 1012 | 1013 | 1014 | 1015 | 1016 | 1017 | 1018 | 1019 | 1020 | 1021 | 1022 | 1023 | 1024 | 1025 | 1026 | 1027 | 1028 | 1029 | 1030 | 1031 | 1032 | 1033 | 1034 | 1035 | 1036 | 1037 | 1038 | 1039 | 1040 | 1041 | 1042 | 1043 | 1044 | 1045 | 1046 | 1047 | 1048 | 1049 | 1050 | 1051 | 1052 | 1053 | 1054 | 1055 | 1056 | 1057 | 1058 | 1059 | 1060 | 1061 | 1062 | 1063 | 1064 | 1065 | 1066 | 1067 | 1068 | 1069 | 1070 | 1071 | 1072 | 1073 | 1074 | 1075 | 1076 | 1077 | 1078 | 1079 | 1080 | 1081 | 1082 | 1083 | 1084 | 1085 | 1086 | 1087 | 1088 | 1089 | 1090 | 1091 | 1092 | 1093 | 1094 | 1095 | 1096 | 1097 | 1098 | 1099 | 1100 | 1101 | 1102 | 1103 | 1104 | 1105 | 1106 | 1107 | 1108 | 1109 | 1110 | 1111 | 1112 | 1113 | 1114 | 1115 | 1116 | 1117 | 1118 | 1119 | 1120 | 1121 | 1122 | 1123 | 1124 | 1125 | 1126 | 1127 | 1128 | 1129 | 1130 | 1131 | 1132 | 1133 | 1134 | 1135 | 1136 | 1137 | 1138 | 1139 | 1140 | 1141 | 1142 | 1143 | 1144 | 1145 | 1146 | 1147 | 1148 | 1149 | 1150 | 1151 | 1152 | 1153 | 1154 | 1155 | 1156 | 1157 | 1158 | 1159 | 1160 | 1161 | 1162 | 1163 | 1164 | 1165 | 1166 | 1167 | 1168 | 1169 | 1170 | 1171 | 1172 | 1173 | 1174 | 1175 | 1176 | 1177 | 1178 | 1179 | 1180 | 1181 | 1182 | 1183 | 1184 | 1185 | 1186 | 1187 | 1188 | 1189 | 1190 | 1191 | 1192 | 1193 | 1194 | 1195 | 1196 | 1197 | 1198 | 1199 | 1200 | 1201 | 1202 | 1203 | 1204 | 1205 | 1206 | 1207 | 1208 | 1209 | 1210 | 1211 | 1212 | 1213 | 1214 | 1215 | 1216 | 1217 | 1218 | 1219 | 1220 | 1221 | 1222 | 1223 | 1224 | 1225 | 1226 | 1227 | 1228 | 1229 | 1230 | 1231 | 1232 | 1233 | 1234 | 1235 | 1236 | 1237 | 1238 | 1239 | 1240 | 1241 | 1242 | 1243 | 1244 | 1245 | 1246 | 1247 | 1248 | 1249 | 1250 | 1251 | 1252 | 1253 | 1254 | 1255 | 1256 | 1257 | 1258 | 1259 | 1260 | 1261 | 1262 | 1263 | 1264 | 1265 | 1266 | 1267 | 1268 | 1269 | 1270 | 1271 | 1272 | 1273 | 1274 | 1275 | 1276 | 1277 | 1278 | 1279 | 1280 | 1281 | 1282 | 1283 | 1284 | 1285 | 1286 | 1287 | 1288 | 1289 | 1290 | 1291 | 1292 | 1293 | 1294 | 1295 | 1296 | 1297 | 1298 | 1299 | 1300 | 1301 | 1302 | 1303 | 1304 | 1305 | 1306 | 1307 | 1308 | 1309 | 1310 | 1311 | 1312 | 1313 | 1314 | 1315 | 1316 | 1317 | 1318 | 1319 | 1320 | 1321 | 1322 | 1323 | 1324 | 1325 | 1326 | 1327 | 1328 | 1329 | 1330 | 1331 | 1332 | 1333 | 1334 | 1335 | 1336 | 1337 | 1338 | 1339 | 1340 | 1341 | 1342 | 1343 | 1344 | 1345 | 1346 | 1347 | 1348 | 1349 | 1350 | 1351 | 1352 | 1353 | 1354 | 1355 | 1356 | 1357 | 1358 | 1359 | 1360 | 1361 | 1362 | 1363 | 1364 | 1365 | 1366 | 1367 | 1368 | 1369 | 1370 | 1371 | 1372 | 1373 | 1374 | 1375 | 1376 | 1377 | 1378 | 1379 | 1380 | 1381 | 1382 | 1383 | 1384 | 1385 | 1386 | 1387 | 1388 | 1389 | 1390 | 1391 | 1392 | 1393 | 1394 | 1395 | 1396 | 1397 | 1398 | 1399 | 1400 | 1401 | 1402 | 1403 | 1404 | 1405 | 1406 | 1407 | 1408 | 1409 | 1410 | 1411 | 1412 | 1413 | 1414 | 1415 | 1416 | 1417 | 1418 | 1419 | 1420 | 1421 | 1422 | 1423 | 1424 | 1425 | 1426 | 1427 | 1428 | 1429 | 1430 | 1431 | 1432 | 1433 | 1434 | 1435 | 1436 | 1437 | 1438 | 1439 | 1440 | 1441 | 1442 | 1443 | 1444 | 1445 | 1446 | 1447 | 1448 | 1449 | 1450 | 1451 | 1452 | 1453 | 1454 | 1455 | 1456 | 1457 | 1458 | 1459 | 1460 | 1461 | 1462 | 1463 | 1464 | 1465 | 1466 | 1467 | 1468 | 1469 | 1470 | 1471 | 1472 | 1473 | 1474 | 1475 | 1476 | 1477 | 1478 | 1479 | 1480 | 1481 | 1482 | 1483 | 1484 | 1485 | 1486 | 1487 | 1488 | 1489 | 1490 | 1491 | 1492 | 1493 | 1494 | 1495</ |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-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|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-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| Input Type                                                                                                                                           | Column                     |             |                |               |                                   | Remarks                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------|----------------|---------------|-----------------------------------|----------------------------------------------------------------|
|                                                                                                                                                      | 1                          | 2           | 78             | 79            | 80                                |                                                                |
|                                                                                                                                                      | Card                       | code        | Second<br>code | Third<br>code | Change<br>code                    |                                                                |
|                                                                                                                                                      | Main                       | Sub         |                |               |                                   |                                                                |
| 1. Control cards<br>Main control card<br>Output report selection<br>Project selection<br>Tape reassignment<br>Security number<br>Program name change | A<br>B<br>C<br>D<br>E<br>F |             |                |               |                                   | Read in off of input<br>tape                                   |
| 2. Parameter cards<br>Read USERS TIME TAPE                                                                                                           | 1                          | A<br>B<br>C |                |               |                                   | Read in off of input<br>tape<br>Carried on Secondary<br>Master |
| 3. Charge no. associated<br>with activities                                                                                                          | 2                          |             |                |               | A-add<br>D-delete<br>C-change     | Carried on Secondary<br>Master                                 |
| 4. Rate conversion changes                                                                                                                           | 4                          |             |                |               | A-add<br>D-delete<br>C-change     | Carried on PERT/<br>Cost Master                                |
| 5. Rainbow Category associated<br>with resource code                                                                                                 | 5                          |             |                |               | A-add<br>D-delete<br>C-change     | Carried on PERT/<br>Cost                                       |
| 6. Cost Category with<br>resource code                                                                                                               | 6                          |             |                |               | A-add<br>D-delete<br>C-change     | Carried on PERT/<br>Cost Master                                |
| 7. Description and responsible<br>unit input                                                                                                         | 7                          |             | 0              |               | A-add<br>D-delete<br>C-change     | PERT/Cost Master                                               |
| 8. Program breakdown input                                                                                                                           | 7                          |             | 1              |               |                                   |                                                                |
| 9. Charge no. changes                                                                                                                                | 7                          |             | 2              |               |                                   |                                                                |
| 10. Actual inputs                                                                                                                                    | 7                          |             | 3              |               | R-replace<br>I-add to<br>D-delete |                                                                |
| 11. Estimated inputs                                                                                                                                 | 7                          |             | 4              | 0<br>to<br>9  | A-add<br>D-delete<br>C-change     |                                                                |
| 12. Budgeted inputs                                                                                                                                  | 7                          |             | 5              | 0<br>to<br>9  | A-add<br>D-delete<br>C-change     |                                                                |

Table III-D-1 Input Coding Assignments

### III-E PERT COST EDIT SORT PHASE

This phase will read the EDITED DATA TAPE, format the input cards for sorting, and set the information out on the sort tape. After sorting is completed, this data is set out on the SORTED DATA TAPE and the phase is completed. The sort used for this phase is the 4-tape sort described in section IV-C. If the "B" option is indicated, the program will finish up at this point and print out the program ending messages. If the option is C, D, or G the program will print out the edit sort ending message and will automatically go into the next phase. On options E or F the edit sort phase is bypassed.

#### Edit Sort Tape Operations

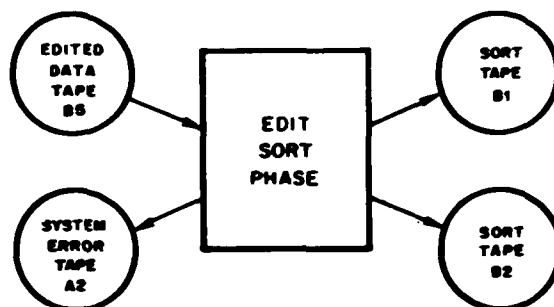
The edit sort phase allows for up to nine SORTED DATA TAPES. The edit sort phase will first read the EDITED DATA TAPES, ignoring the control cards. These tapes contain single unblocked records in BCD. This phase will then take each record, re-format it with the proper sort key, and set it out on the 4-tape sort. The above operation will continue until all the EDITED DATA TAPES have been completed. At this point the program will go into the merge phase of the sort. At the completion of this phase, the program will begin setting up records from the sort into binary blocks of 200 words to be placed on the SORTED DATA TAPE. The SORTED DATA TAPE will be a second file following the EDITED DATA TAPE and may consist of a maximum of nine tapes.

The purpose in setting the SORTED DATA TAPE as a second file is to avoid changing tape during the program operation. As discussed earlier, the last two INPUT DATA TAPES are used for other purposes and the information on these tapes is destroyed. To avoid going back to a card-to-tape operation, the acceptable data for all the INPUT DATA TAPES plus control cards are kept on the EDITED DATA TAPE. Thus, in case of a redundancy on the SORTED DATA TAPE, the input and control cards can be recovered without putting a different tape on the computer, since they are contained in

the file preceding the sorted data on the same physical tape. The program can simply be restarted, and the EDITED DATA TAPES then become the INPUT DATA TAPES.

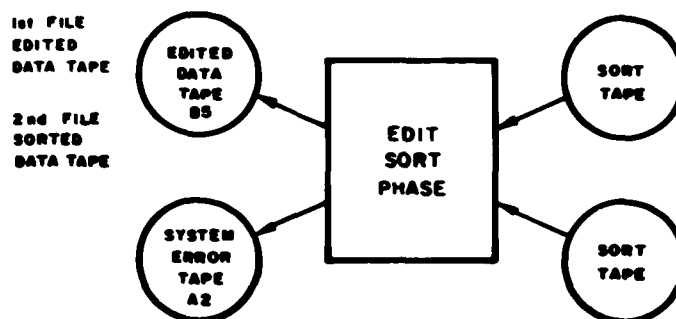
The tape flow for the edit sort phase will take the following form:

During data read-in, formatting and sorting the configuration is



When all of the EDITED DATA TAPES have been completed the last tape is not rewound. At this point the sort will take over and arrange the edited data in proper sequence using tapes B1, B2, A7 and A4 as the merge tapes.

During the last merge pass the sort will pass control to the edit sort phase and the SORTED DATA TAPE will be developed as a second file on B5. The configuration is



The final merge tapes to be used are dependent upon the number of merge passes made by the sort. At the completion of this phase the sorted data tape is rewound and unloaded according to the option that is selected. For option B the tape is both rewound and unloaded; for all other options it is only rewound.

#### Edit Sort Tape Messages On-Line

The messages forthcoming on the on-line printer regarding the edit sort tapes will be as follows, depending on the number of tapes used and the governing option:

- a) One edited tape with the sorted information to be set onto the same tape.

```
TAPE B5 HAS BEEN SELECTED FOR READING
COMPLETED READING OF EDITED TAPE B5
* * * DO NOT REWIND * * *
TAPE B5 HAS BEEN SELECTED FOR WRITING
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD
END OF PERT COST EDIT SORT PHASE
```

For Option B, the above messages will be followed by the program ending message and the system will stop. For Options C, D, and G, line 5 will be changed to read

```
TAPE B5 IS NOW REWINDING
```

and the system will automatically go into the time-merge or cost-update phase after the above messages. Options E and F do not pass through the edit sort phase.

- b) More than one edited tape with the sorted information to be set onto more than one tape.

To get to the start of the EDITED DATA TAPES the following messages will be set out:

```
SET FIRST EDITED TPE OF SERIES ON B5
IF PROPER REEL IS PLACED ON UNIT HIT - START
```

At this point the regular I/O messages will be set out as follows:

TAPE B5 HAS BEEN SELECTED FOR READING  
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD  
SET NEXT REEL OF THIS SERIES ON TAPE B5  
TAPE B5 HAS BEEN SELECTED FOR READING

(the above set of messages can  
continue for up to 9 tapes)

COMPLETED READING OF EDITED TAPE B5  
\* \* \* DO NOT REWIND \* \* \*  
TAPE B5 HAS BEEN SELECTED FOR WRITING  
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD  
SET NEXT REEL OF THIS SERIES ON TAPE B5  
TAPE B5 HAS BEEN SELECTED FOR WRITING

(the above 3 messages can  
continue for up to 9 tapes)

TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD  
END OF PERT COST EDIT SORT PHASE

For Option B, the above messages will be followed by the program ending message and the system will stop. The SORTED DATA TAPE inputs into Option E or F will be the first tape that contains sorted information. Those tapes that contain only edited data should not be set back on the computer, but should be saved in case an error occurs on the sorted data. Prior to printing the phase ending message of the above series, the following information will be set out on the printer for Options C, D, or G

SET FIRST SORTED TAPE OF SERIES ON B5  
IF PROPER REEL IS PLACED ON UNIT HIT - START

and under these options the system will automatically go into the next phase.

All of the above messages refer to non-alternating tapes. Anytime a new tape is set onto the computer, the system will stop until the tape is in a ready position.

When the message "SET NEXT REEL OF THIS SERIES ON TAPE B5" is set out for the reading of the EDITED DATA TAPES it means that these tapes should be read in the order that they were created. When it is set out for the writing of the SORTED DATA TAPES it means that a blank or utility tape should be set on that unit to write the next tape of the series.

#### Edit Sort Error Message

There is only one error message that can be produced during the edit sort phase. This message will stop the system and be set out on the on-line printer.

ERROR IN CARD CODE AFTER EDIT PASS  
XX - 80 Characters of Input Code - XX

If the card code is not in the range of 1 to 7 the above message will be printed. (The second line of this message is a reproduction of the input card to which the message applies.) This problem is probably due to a computer error, since the card code had been checked and found correct in the edit phase.

#### Edit Sort Sequencing Parameters

The following parameters are used to develop the sorting sequence for the input cards. Each individual card type will have its own sort key but all cards will be sorted together. The sort key used for this card type will be 5 words and this information will precede the regular 14-word record. The data in the sort key will, in most cases, duplicate information in the original record. The matrix given in Fig. III-E-1 will show the sort key for each of the individual input cards. EX86 is a location in core that is set up from the successor-predecessor indicator in Column 4 of the "A" control card. If Column 4 is blank or zero, EX86 = 0; otherwise, EX86  $\neq$  0.

| WORD<br>CHAR          | 1         |   |   |   |   |   | 2               |   |   |   |   |   | 3                                                        |   |   |   |   |   | 4                                |   |   |   |   |   | 5             |   |   |   |   |   |
|-----------------------|-----------|---|---|---|---|---|-----------------|---|---|---|---|---|----------------------------------------------------------|---|---|---|---|---|----------------------------------|---|---|---|---|---|---------------|---|---|---|---|---|
|                       | 1         | 2 | 3 | 4 | 5 | 6 | 1               | 2 | 3 | 4 | 5 | 6 | 1                                                        | 2 | 3 | 4 | 5 | 6 | 1                                | 2 | 3 | 4 | 5 | 6 | 1             | 2 | 3 | 4 | 5 | 6 |
| INPUT<br>CARD         | CARD CODE |   |   |   |   |   | CARD NUMBER     |   |   |   |   |   | NOT APPLICABLE                                           |   |   |   |   |   |                                  |   |   |   |   |   |               |   |   |   |   |   |
|                       | CARD CODE |   |   |   |   |   | NETWORK CODE    |   |   |   |   |   | IF EX 88 10 PREDECESSOR NO.<br>IF EX 88 10 SUCCESSOR NO. |   |   |   |   |   | SUCCESSOR NO.<br>PREDECESSOR NO. |   |   |   |   |   | CHRG CODE     |   |   |   |   |   |
| 2                     | CARD CODE |   |   |   |   |   | NOT APPLICABLE  |   |   |   |   |   | NOT APPLICABLE                                           |   |   |   |   |   | NOT APPLICABLE                   |   |   |   |   |   | CHRG CODE     |   |   |   |   |   |
| 4                     | CARD CODE |   |   |   |   |   | PERFORMING UNIT |   |   |   |   |   | RESOURCE CODE                                            |   |   |   |   |   | N/A                              |   |   |   |   |   | CHRG CODE     |   |   |   |   |   |
| 5                     | CARD CODE |   |   |   |   |   | RESOURCE CODE   |   |   |   |   |   | NOT APPLICABLE                                           |   |   |   |   |   | NOT APPLICABLE                   |   |   |   |   |   |               |   |   |   |   |   |
| 6                     | CARD CODE |   |   |   |   |   | RESOURCE CODE   |   |   |   |   |   | NOT APPLICABLE                                           |   |   |   |   |   | NOT APPLICABLE                   |   |   |   |   |   |               |   |   |   |   |   |
| 7 0                   | CARD CODE |   |   |   |   |   | CHARGE NUMBER   |   |   |   |   |   | 0 0 0 0 0 0                                              |   |   |   |   |   | 0 0 0 0 0 0                      |   |   |   |   |   | CHRG CODE     |   |   |   |   |   |
| 7 1                   | CARD CODE |   |   |   |   |   | CHARGE NUMBER   |   |   |   |   |   | 0 0 0 0 0 0                                              |   |   |   |   |   | 0 0 0 0 0 0                      |   |   |   |   |   | CHRG CODE     |   |   |   |   |   |
| 7 2                   | CARD CODE |   |   |   |   |   | CHARGE NUMBER   |   |   |   |   |   | 0 0 0 0 0 0                                              |   |   |   |   |   | 0 0 0 0 0 0                      |   |   |   |   |   | CHRG CODE     |   |   |   |   |   |
| 7 3                   | CARD CODE |   |   |   |   |   | CHARGE NUMBER   |   |   |   |   |   | PERFORMING UNIT                                          |   |   |   |   |   | PERFORMING UNIT                  |   |   |   |   |   | RESOURCE CODE |   |   |   |   |   |
| 7 4                   | CARD CODE |   |   |   |   |   | CHARGE NUMBER   |   |   |   |   |   | PERFORMING UNIT                                          |   |   |   |   |   | PERFORMING UNIT                  |   |   |   |   |   | RESOURCE CODE |   |   |   |   |   |
| 7 5                   | CARD CODE |   |   |   |   |   | CHARGE NUMBER   |   |   |   |   |   | PERFORMING UNIT                                          |   |   |   |   |   | PERFORMING UNIT                  |   |   |   |   |   | RESOURCE CODE |   |   |   |   |   |
| CARD 2ND<br>CODE CODE | 1         | 2 | 3 | 4 | 5 | 6 | 1               | 2 | 3 | 4 | 5 | 6 | 1                                                        | 2 | 3 | 4 | 5 | 6 | 1                                | 2 | 3 | 4 | 5 | 6 | 1             | 2 | 3 | 4 | 5 | 6 |

IN THE 8 BITS  
OF THIS CHARACTER  
WILL TAKE THE  
FOLLOWING FORM:  
BIT 1  
0 = 4 SECOND CODE  
1 = 5 SECOND CODE  
BITS 2-5  
VALUE 1 TO 9  
INDICATING THIRD  
CODE  
BIT 6  
0 = ADD  
1 = DELETE OR  
CHANGE  
N/A NOT APPLICABLE

Fig. III-E-1 Input Data Sort Key Matrix

### Edit Sort Region Description

The following region description will describe the major subroutine used in the edit sort phase.



Region EDSO

**EXPLANATION OF REGION:**

This routine will perform the formatting and sorting for the edited input data.

**CALLING SEQUENCE:**

L     TSX   EDSO, 4

L+1   Normal return

**INPUT:**

Up to nine EDITED DATA TAPES.

**OUTPUT:**

Up to nine SORTED DATA TAPES.

**STORAGE USED:**

Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

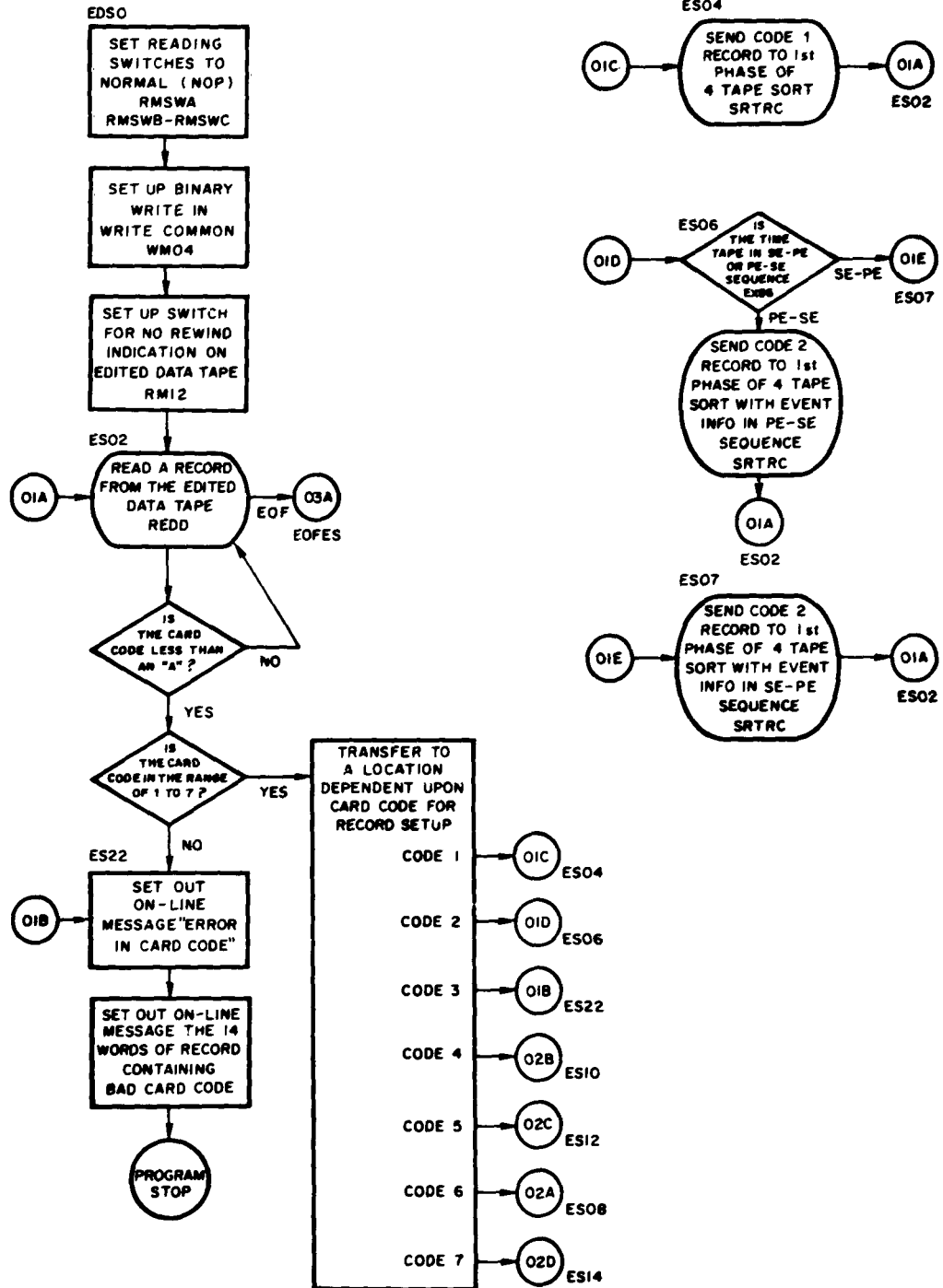
Not applicable.

**EXPLANATION OF CALLING SEQUENCE:**

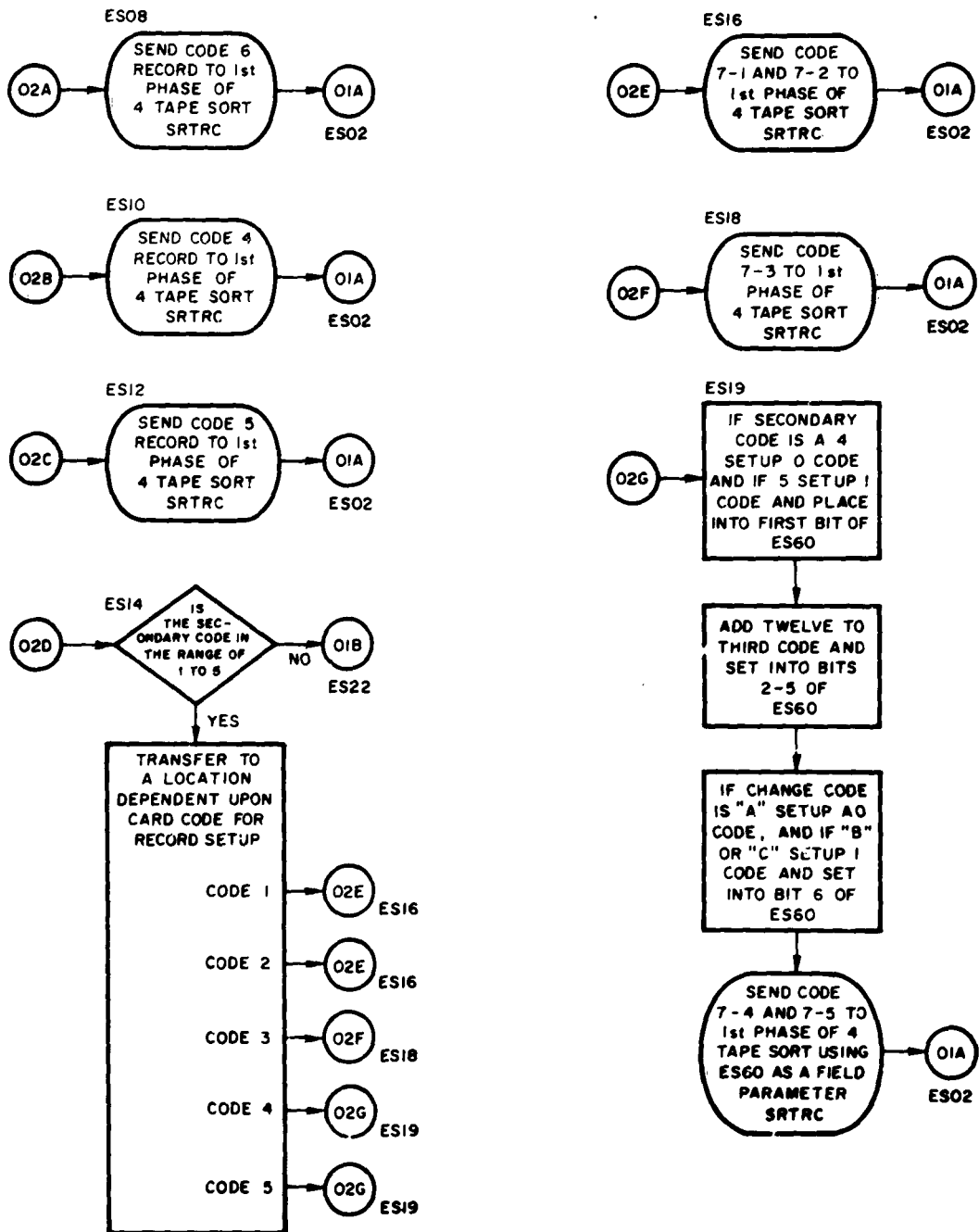
If an error is found, the input and error message will be set out on the on-line printer and the program will halt.

# REGION EDSO

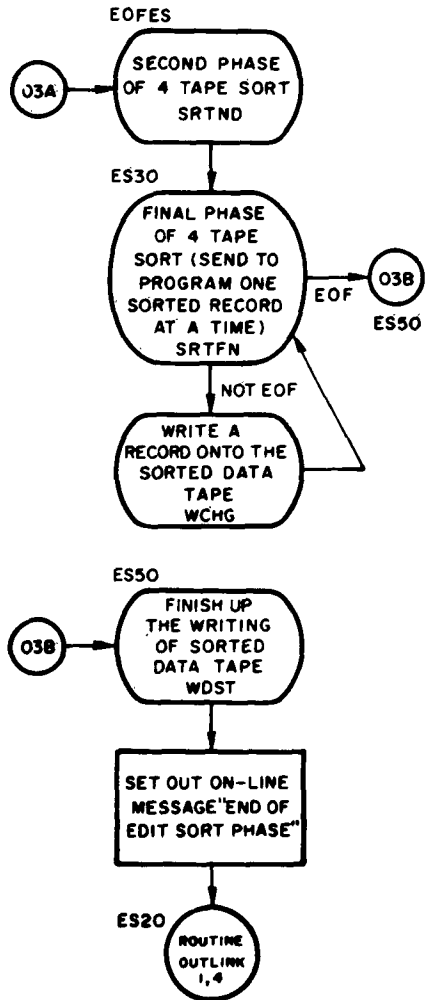
## EDIT SORT PHASE



REGION EDSO



REGION EDSO



### Edit Sort Tape Layouts

This subsection shows pictorially the tape layouts involved in the Edit Sort phase. The layout of the EDITED DATA TAPE was described on Page III-D-53.

Edited Tape Label  
(BCD Mode)

This section only  
set onto the first  
tape of the edited  
data tape series.

|                                                                                          |
|------------------------------------------------------------------------------------------|
| Edited Raw Data Tape<br>DDMMYY TPE                                                       |
| End-of-Record Gap                                                                        |
| (Program Name)                                                                           |
| End-of-Record Gap                                                                        |
| Control Card Section<br>(15-word records)                                                |
| These records are bypassed<br>when reading this tape to<br>develop the sorted data tape. |
| End-of-Record Gap                                                                        |
| First Edited Data Input                                                                  |
| End-of-Record Gap                                                                        |

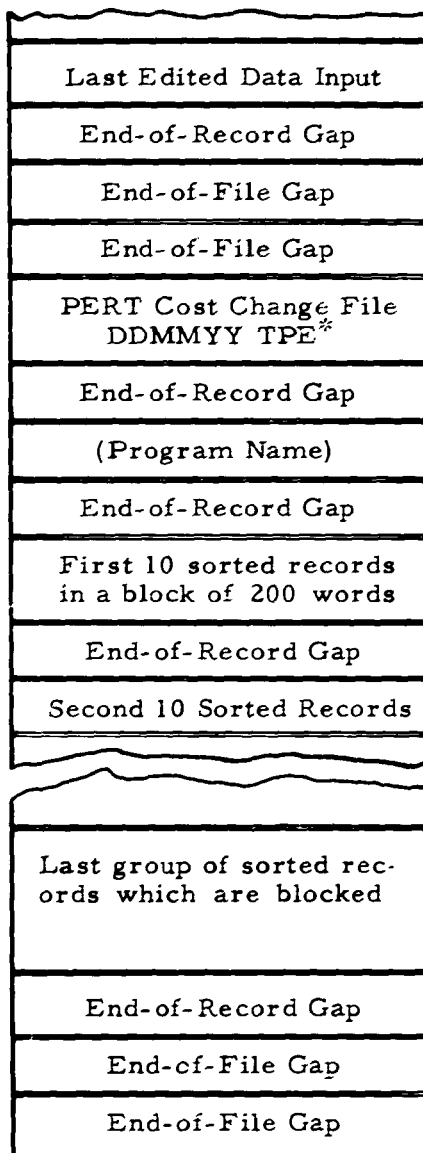
6 words long

4 words long

Each of the records  
below the label,  
other than the end  
of record gaps,  
will be 15 words  
long and written  
in the BCD mode.

Sorted Tape Label  
(BIN Mode)

The "first" and  
"last" reference  
to sorted records  
refers only to this  
physical tape.



6 words long

4 words long

Each of the records  
below the label,  
other than the end  
of record gaps,  
will be 200 words  
long and written  
in the BIN mode.

This record if  
relating to the last  
tape of the series  
may contain from  
1 to 10 records  
in its block.

\*\*

\* The first sorted data tape will have a "1," indicating it was the first tape created of this series. If any additional sorted data tapes are created they will be numbered consecutively from 2 to 9.

\*\* The configuration shown represents the last tape of a series. If it is not the last tape of a series an additional record of one word is inserted between the two end-of-file gaps as explained on Page III-B-10.

Each individual block of sorted data will be made up of 10 records, except for the last block, and each logical record will take the following form:

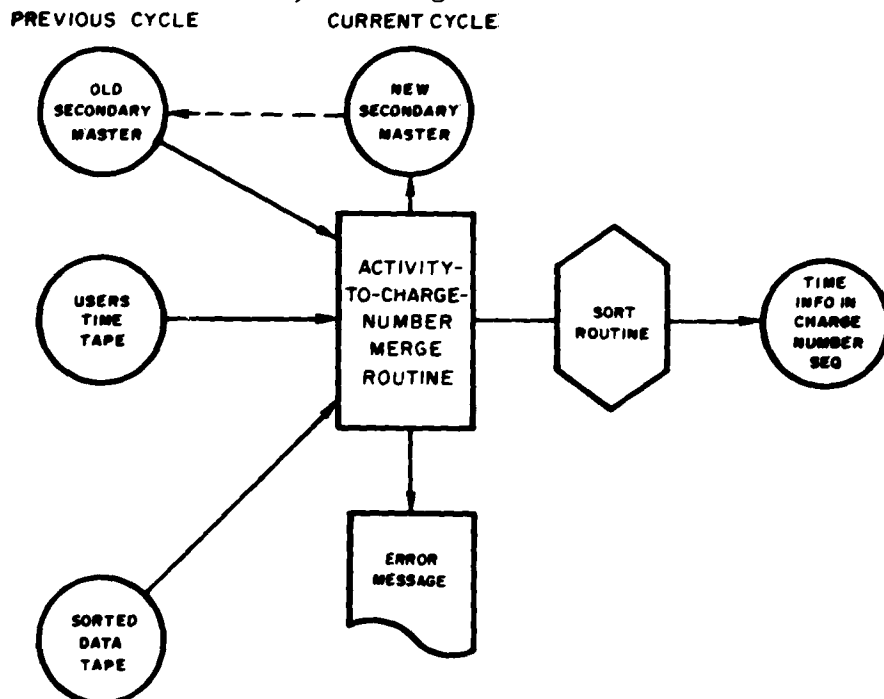
|       |    |                    |
|-------|----|--------------------|
| Words | 1  |                    |
|       | 2  |                    |
|       | 3  | Sort key as        |
|       | 4  | described in       |
|       | 5  | Figure III-E-1     |
|       | 6  |                    |
|       | 7  |                    |
|       | 8  |                    |
|       | 9  |                    |
|       | 10 |                    |
|       | 11 | 14-word layout of  |
|       | 12 | input data card    |
|       | 13 | with little or no  |
|       | 14 | alteration from    |
|       | 15 | the original input |
|       | 16 |                    |
|       | 17 |                    |
|       | 18 |                    |
|       | 19 |                    |
|       | 20 | Check sum          |

Developed by  
writer routine

### III-F PERT COST TIME MERGE PHASE

#### Time Merge General Description

In the time merge phase, the charge or summary numbers are merged with activity information from a PERT Time tape or cards to generate a time information tape for use during the PERT Cost Update phase. This selected time information for the Cost Update will be sequenced into charge number order by means of a 4-tape sort. Only activities related to a charge or summary number will be included on this output tape. The time merge phase is accomplished by two routines--the activity-to-charge-number merge routine and the activity-to-charge-number sort, as illustrated below.



In the preceding diagram, the PERT Time tapes are referred to as the USERS TIME TAPE, which will contain the activity information to be merged. The inputs that tie the activities to charge or summary numbers were verified in the preceding Edit and Edit Sort phase and come into the system from the SORTED DATA TAPE. The system will read and interpret the USERS TIME



TAPE by means of a set of parameter cards which were read in during the file establishment and which likewise come into the system from the SORTED DATA TAPE. The activity/charge number information is retained on the SECONDARY MASTER TAPE in blocks of 600 words and can be modified by adds, deletes, or changes in the existing file. The input parameters are developed by the system into an INPAR table of 350 words, as described in the following subsections, and is set out onto the NEW SECONDARY MASTER TAPE for use in the next cyclic run.

The output tape from the activity-to-charge-number merge will be in PE-SE or SE-PE sequence and its data will be sorted by charge number in the follow-up routine. The sorted information will be then used during the PERT Cost Update phase.

At the end of the time merge phase, a message indicating the number of errors encountered during the processing will be displayed on the on-line printer. This message will take one of the following forms:

- (a)   XXXX ERRORS DETERMINED  
          IF RUN IS TO BE CONTINUED EVEN THOUGH ERRORS  
          INDICATED HIT START
- (b)   NO ERRORS DETERMINED

If message (a) is printed out the program will stop. If these errors are to be ignored, the start button at the console is hit and they are bypassed. The program will then go into the activity-to-charge-number sort and continue on into its next phase. Where there are no errors indicated (Message (b)), the program will automatically go on to the activity-to-charge-number sort.

#### Time Merge Input Parameters

The input parameter system for the PERT time merge phase was developed in order to maintain a capability to read most PERT Time system tapes without having to modify the existing PERT Cost program. In the development of this parameter system the following three distinct types of cards

were produced: general description cards, file description cards, and field description cards.

#### General Description Cards (Type 1A)

These cards contain the code of "1A" in columns 1 and 2. They contain information that relates to the general characteristics of the PERT Time tape that is to be used. Some of the characteristics that are defined in these cards are: (1) the PERT Time network base date, (2) whether the PERT Time calculations are based on the start or the base date, and (3) whether  $T_S$  and  $T_A$  use the same location in the PERT Time file.

The complete set of characteristics contained in type 1A cards is coded as follows: (See Subsec. 3.5.6 for table layouts):

1. Sort Required Indicator - Column 12

If the USERS TIME TAPE is in some sequence other than PE-SE or SE-PE sequence, Column 12 is set to a character other than blank or zero. This indicator is located at INPAR + 0: 1 = sort required, 0 or blank = sort not required.

2. Network Base Date - Columns 5 to 11

If a network start date is in elapsed time relevant to a network base date, or if the activity data are related to a network base date, this date must be present. It will be set up in a DDMMYY format with the month being represented in an alphabetic configuration containing the first three characters of the month.

3. Base or Start Date Indicator - Column 13

If the dates in the USERS TIME TAPE are carried as a number, this indicator is set to relate the time dates to the start or the base date of the network. Whichever of the two dates is used it will become the value to which the elapsed time values are added in order to arrive at a calendar date. The indicator is located at Inpar + 3: 1 = calculations made using base date, 2 = calculations made using start date. These same indicator values will appear in the "1A" control card in Column 13.

4. Actual Code Indicator - Column 14

If  $T_S/T_A$  are located in the same physical word of the USERS TIME TAPE a scheduled or actual flag (INPAR + 340) is used. This flag will indicate whether the actual or scheduled dates are located in the  $T_S/T_A$  field. Once this flag has been isolated the value is compared with the actual code indicator (INPAR + 4). If it agrees, the  $T_S/T_A$  field is an actual date, but if it does not, it is a scheduled date.

5.  $T_S/T_A$  Set-up Code - Column 15

If  $T_S/T_A$  are located in the same physical word of the USERS TIME TAPE this column can be blank or zero. If they are in separate words this indicator is set to a character other than zero or blank. When the  $T_S/T_A$  dates are in two separate fields, the actual code indicator and the scheduled or actual flag do not have to be set. The scheduled date field will then be found in the  $T_S/T_A$  field (INPAR + 330) and the actual date location will then be found in the  $T_A$  field (INPAR + 344).

File Description Cards (Type 1B)

These cards contain the code "1B" in Columns 1 and 2. The information carried in these cards relates to the file characteristics of the PERT Time tape that is to be used. These cards indicate the type of records in the file, as well as the number of files. They give the PERT Cost program the capability to read the tape and to be aware of the kind of record it has read. The elements used, their codes, and the purpose of each field are described below:

1. Card Order Number - Columns 3-4

This code allows a maximum of 75 cards, which must be in the same order as the USERS TIME TAPE. This code is part of the sort sequence for the card. As these cards come in to the system from the SORTED DATA TAPE they are translated into 4-word configuration groups starting at INPAR + 10 and ending at INPAR + 309. If the maximum number of "1B" cards is not used, the remaining blocks will be filled with zeros.

2. File Order Number - Columns 5-6

This code designates a file and represents a family of record types. Each different, sequential file represented on the USERS TIME TAPE gets an order number larger by 1 than the previous file. This number is carried as a binary value in bits 3-17 of the first word of the file description set.

3. Record Type Number - Column 7

This code links the individual fields, by record type, to a particular record in the file. A maximum of seven record types can be used. These types may be present in more than one file. The record type number used for a particular field will have a corresponding code number for that field in the "1C" cards, no matter which file of the USERS TIME TAPE relates to it. This value is carried in bits 18-20 of the first word of the file description set. If the record type number is zero it will indicate to the program that this is the only card for this file and that this file is to be skipped in processing the USERS TIME TAPE.

4. One-or-Many Indicator - Column 8

This indicator will show whether only one of this type of record or many records of this type are in a particular file of the USERS TIME TAPE. This code is carried in bit 5 of the fourth word of the file description set. The code used for this indicator is: 0 or Blank = many of this record type in file; 1 = only one of this record type in file.

5. Length of Logical Record - Columns 9-11

If the record being described by this particular "1B" card is a blocked record of a fixed length, the number of words in the logical record are indicated. If this record is not blocked or is made up of variable sized logical records, this field is left blank. If it contains a value, it is converted to binary and is carried in bits 21-35 of the first word of the file description set.

6. Read Mode - Columns 12-14

This field will contain either "BCD" or "BIN" according to the mode used in developing this particular record on the USERS TIME TAPE. The above mnemonics are converted to 1 and 0, respectively, and are set into the S-bit of the second word of the file description set.

7. End-of-Block Code - Columns 15-17

This code will be either "EOL" to indicate that this record is part of a block, or "EOR" to indicate that this record is terminated by an end-of-record mark. The "EOR" condition will convert to a 1 and the "EOL" to a 2 and these codes will be set into bits 1 and 2 of the first word of the file description set.

8. Record ID Code - Columns 18-23

This code will be used in identifying individual records of the USERS TIME TAPE. It will be set into the third word of the file description set, and compared to the file ID code of the USERS TIME TAPE as determined by the information in Columns 24-30. This code will always be right-justified, since the ID code from the USERS TIME TAPE will be forced to the right by the program. If the code is less than 6 characters or a full word, leading zeros should be set into the record ID code field. If the code is greater than 6 characters, the six most meaningful should be selected and set into this field, as well as into the retrieval fields in Columns 24-30. If there is no record ID code, this field is left blank, as is Columns 24-30, and the record being checked from the USERS TIME TAPE is assumed to be the record wanted.

9. Word Position in Record for ID - Columns 24-25

This field will indicate the location in the record that the ID field can be found. This location is converted to binary and set into bits 21-35 in the second word of the file description set. The first word of the record is considered as 1 instead of zero for all references to this record.

10. Retrieval Mode for ID - Column 26

This field will indicate the mode in which this record ID is carried in the USERS TIME TAPE. There are three possible modes that can be used:

C = characters and is converted to a 1

W = words and is converted to a 2

B = binary and is converted to a 3

This converted value is set into bits 18-20 of the second word of the file description set.

11. Field Start Position for ID - Column 27-28

This start position will indicate the location in the word that this field begins. It will vary with the retrieval mode used. If words are used, this field is left blank. If characters are used, this field will contain a value in the range of 1 to 6 indicating the character start position. If it is a binary mode, this field will contain a value in the range of 1 to 36 indicating the bit start position. This number is converted to binary and set into bits 3-11 in the second word of the file description set.

12. Number of Units for ID - Columns 29-30

This field will contain the number of units that are tied to the retrieval code for the record ID. If the retrieval code indicates the ID is carried as words, this field has to be 1, since the program cannot handle an ID of more than one word. If the code denotes characters, this field will have to be in the range of 1 to 6; if the ID is binary, the field must be in the range of 1 to 36. This number is converted to binary and set into bits 12-17 in the second word of the file description set.

13. Variable Record Indicator - Column 31

This code will indicate that the logical record involved is of variable word length and that the information in columns 32-38 will state where the count of the words is located in this record. The letter V in this column will indicate a variable record, and it will cause a 1 to be set into the sign bit of the first word of the file description set.

14. Retrieval Information for Variable Record Count - Columns 32-38

The information regarding these fields are the same as discussed in items 9-12 above, except that this data is set into the fourth word of the file description set instead of the second. The count developed from this data is used as the length of logical record to determine the size of the record in the block.

In the processing of the input parameter file-description cards, a "found" indicator is located in bit 1 of the fourth word of the file description set. This indicator is set when a particular record is located. If this file has been completed and one of the records has not been located, the system will stop and an error message will be forthcoming. (Page III-F-14).

Field Description Cards (1-C)

These cards are coded "1C" in Columns 1 and 2. They contain the data that relate to the individual fields of the PERT Time tape that is to be used. These cards indicate where in the record the requested data can be found as well as how large a field is involved. The card indicates on fields that use dates or binary representations of time the type of information used. The information recorded and the codes used are described below.

1. Field Code Number - Columns 3-4

This code is preset and will relate the field description code to a particular field. This code will be in the range of 01 to 18 and is part of the sort sequence for this card. As these cards come into the system from the SORTED DATA TAPE they are translated into a 2-word configuration starting at INPAR + 310 and ending at INPAR + 344. If there is no card for a particular field, the 2-word configuration will remain at zero.

2. Record Type - Column 5

This code ties a particular field to a record in the file. A number from 1 to 7 should appear for every field that is to be used. This code should correspond to the record type in the file description card if this field is a part of that record. In assigning the record type code, the lower number of a set should be given to the first records read in, and then the higher numbers to the following, in their respective order. The reason is that in developing the pseudo-time record from the USERS TIME TAPE, all the fields with a record type number equal to or larger than the one being currently worked upon will be cleared out. This capability allows the program to use multi-record types to develop a pseudo-time record, and to keep certain fields while clearing out others. This code is set into bits S-2 in the first word of the field description set.

3. Word Position in Record - Columns 6-8

This field indicates the location in the record where this item can be found. This location is converted to binary and set into bits 21-35 in the first word of the field description set. The first word of the record is set up as a 1 instead of 0 for all references to this record.

4. Retrieval Mode - Column 9

This field indicates the mode used for this item in the USERS TIME TAPE:

C = characters, and is converted to a 1

W = words, and is converted to a 2

B = binary, and is converted to a 3

This converted value is set into bits 18-20 of the first word of the field description set.

5. Sign Position - Columns 10-11

This field indicates the location of the sign position connected to one of the parameter input fields. It will apply only to those fields that can be either plus or minus, such as slack,  $T_L$ , or  $S_L$ . This field is expected to be located in one of the binary bits of the word containing the numeric value. If this bit is a zero the sign is made plus, if it is a one the sign is set to minus. The location of the sign position is set into bits 3-17 of the second word of the field description set.

6. Field Start Position - Column 12-13

This start position indicates the location in the word where this field begins. It will vary according to the retrieval mode used. If words are used this field is left blank. If characters are used this field will contain a value in the range of 1 to 6 indicating the character start position. If it is a binary mode, this field will contain a value in the range of 1 to 36 indicating the bit start position. This number is converted to binary and set into bits 3-11 in the first word of the field description set.

7. Number of Units - Columns 14-15

This field contains the number of units that are tied to the retrieval code for this input. If the retrieval code indicates words, this field will state the number of full words that make up this item. If it is characters, this field will indicate the number of characters, which may extend over many words, that will make up this item. If the retrieval mode is in binary the value will be in the range of 1 to 36. The number of units value is converted to a binary number and is set into bits 12-17 in the first word of the field description set.

8. Format Mode - Column 16

The format mode relates to all data that will take the form of a date or elapsed time value. It indicates the manner in which these values are carried in the USERS TIME TAPE. The codes and converted values that are used, and the way the information is carried by the USERS TIME TAPE, are as follows:

B = binary; converted to a 1. The number of work days from a base date is carried in binary.

D = calendar date; converted to a 2. The actual calendar date that relates to this item is carried in BCD.

W = weeks  $\times 10$ ; converted to a 3. The number of weeks times ten from a base date is carried in binary.



T = weeks and decimal tenths; converted to a 4. The number of weeks and tenths as a decimal value from a base date is carried in binary.

F = floating point; converted to a 5. The weeks and decimal tenths value is carried in a floating-point configuration to be added to a base date.

C = BCD days; converted to a 6. The number of work days from a base date is carried in BCD.

K = BCD weeks and decimal tenths; converted to a 7. The number of weeks and tenths is carried as a BCD value from a base date. A decimal point or any other character may be used to separate the fraction from the whole number.

This format mode value, from 1 to 7, is set into bits 18-20 of the second word of the field description set.

9. Sub-format Mode - Column 17

This code will relate to the format mode that is discussed in 8 above. Three of these format mode categories will be split into a more detailed breakdown of the information in the USERS TIME TAPE. The following are these breakdowns:

If the D code is used in the format mode category, the following codes will indicate the date configuration used.

Code 1 = DDMMYY

Code 2 = MMDDYY

Code 3 = DDMMMYY }  
Code 4 = MMMDDYY }      Alphabetic Month

Code 5 = DD-MM-YY

Code 6 = MM-DD-YY

If the T code is used in the format mode category, the number of bits from 0-7 that comprise the decimal value is set into this column.

If the K code is used in the format mode category, the following codes will indicate the presence of a decimal indicator or the lack of it, and the number of decimal characters.

Code 0 = no decimal portion to item

Code 1 = no decimal point and 1 decimal character

Code 2 = no decimal point and 2 decimal characters

Code 3 = no decimal point and 3 decimal characters

Code 4 = decimal point and no decimal characters

Code 5 = decimal point and 1 decimal character

Code 6 = decimal point and 2 decimal characters

Code 7 = decimal point and 3 decimal characters

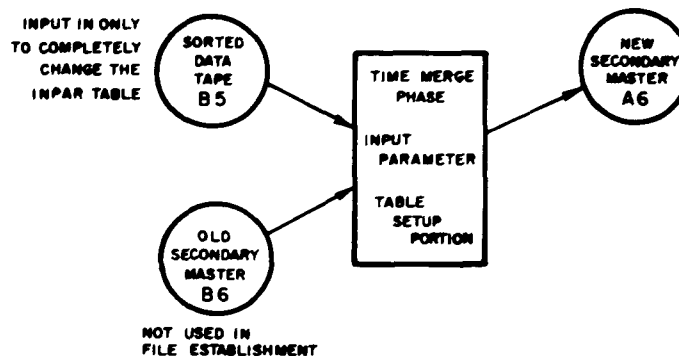
These values, in the range of 0 to 7, are set into bits S-2 of the second word of the field description set.

#### Time Merge Input Parameter Table Operations

The input parameter cards are initially read in during file establishment and a table of 350 words at location "INPAR" is developed. These cards, if present, will be the first cards read from the SORTED DATA TAPE; therefore, this table development is the first operation completed in the PERT Cost time merge phase. After this table has been developed it is set out on the NEW SECONDARY MASTER TAPE for usage on the next cyclic run. If during the next cyclic run there are no input parameter cards, the table from the OLD SECONDARY MASTER TAPE is used and this table will again be set out on the NEW SECONDARY MASTER. There is no provision for updating this table. Any time a "1" card is found on the SORTED DATA TAPE it will indicate to the program that a new INPAR table will be developed. Therefore, if a change is to be made to the INPAR table the entire set of "1" type parameter cards will have to be reentered into the system.

After the completion of the edit and edit sort phase, the tape on A6 containing the raw data is rewound but not unloaded. This tape will become the NEW SECONDARY MASTER TAPE, and the first item set onto this tape will be the input parameters. If the system is in a file establishment mode the input parameters are developed into the INPAR table and set out onto the NEW SECONDARY MASTER TAPE. If this system is to be run without time data, a pseudo INPAR table is set out containing 350 words of zero. The following

diagram shows the tapes that can be used during this portion on the time merge phase.

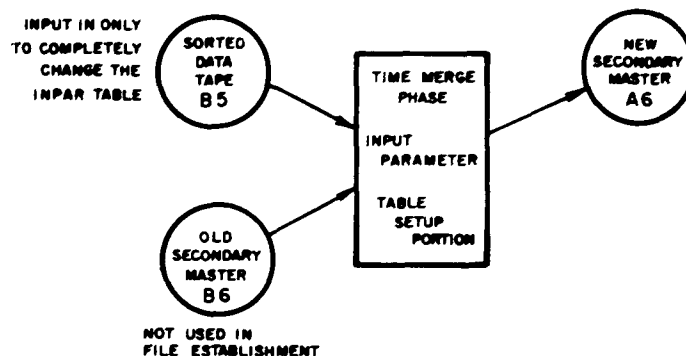


After this table has been developed it will be used during the merging of time data with charge numbers to read the USERS TIME TAPE. Each activity of the USERS TIME TAPE is developed with certain selected time information, as determined by the input parameter cards. This activity is then compared with the activity to charge number information and if they match this record is set out on the sort tapes. If they do not match the time information is ignored and the next time record is developed. It is possible, in the parameter card system, to pick up the charge number from the USERS TIME TAPE. In this case, no merge takes place and those activities that contain a charge number are sent out onto the sort tape. If the USERS TIME TAPE contains a sequence other than PE-SE or SE-PE the program will develop a PSEUDO USERS TIME TAPE. This tape will then be sorted into PE-SE sequence, after which it will be merged with the activity-to-charge-number information.

#### Time-Merge Input Parameter Error Messages

In developing the INPAR table from the input parameters, the following error or exception messages can be produced, depending on the type of error. The program will first pass through the entire set of parameter cards, indicating the error as it occurs but continuing on to the next card. When the input parameter cards are completed and there have been no

diagram shows the tapes that can be used during this portion on the time merge phase.



After this table has been developed it will be used during the merging of time data with charge numbers to read the USERS TIME TAPE. Each activity of the USERS TIME TAPE is developed with certain selected time information, as determined by the input parameter cards. This activity is then compared with the activity to charge number information and if they match this record is set out on the sort tapes. If they do not match the time information is ignored and the next time record is developed. It is possible, in the parameter card system, to pick up the charge number from the USERS TIME TAPE. In this case, no merge takes place and those activities that contain a charge number are sent out onto the sort tape. If the USERS TIME TAPE contains a sequence other than PE-SE or SE-PE the program will develop a PSEUDO USERS TIME TAPE. This tape will then be sorted into PE-SE sequence, after which it will be merged with the activity-to-charge-number information.

#### Time-Merge Input Parameter Error Messages

In developing the INPAR table from the input parameters, the following error or exception messages can be produced, depending on the type of error. The program will first pass through the entire set of parameter cards, indicating the error as it occurs but continuing on to the next card. When the input parameter cards are completed and there have been no

errors indicated, the program will go into the next section of the program automatically. If there have been errors the following message will be set out on the on-line printer and the system will stop.

#### HALT FINISHED PROCESSING TYPE 1 CARDS

The following messages, set out on the on-line printer, will indicate the reasons for the above halt.

- a.     ERROR 1B ORDER NO.                               COLS. 3-4  
  
The card order number in Columns 3 and 4 of type 1B card is out of sequence, is a zero, or is greater than 75.
- b.     ERROR 1B FILE ORDER NO.                           COLS. 5-6  
  
The file order number of a 1B card is out of sequence, is blank, or is not numeric.
- c.     ERROR 1B RECORD TYPE                               COL. 7  
  
The record type code of a 1B card is not in the range of 0 to 7 or there is more than 1 zero for the same file order number.
- d.     ERROR 1B ONE/MANY INDIC                           COL. 8  
  
This indicator is not 0, blank, or 1.
- e.     ERROR 1B READ MODE                                COLS. 12-14  
  
The mode is not indicated as BIN or BCD.
- f.     ERROR 1B END OF BLOCK CODE                       COLS. 15-17  
  
The code is not indicated as EOR, EOL, or blank.
- g.     ERROR 1B REC. ID MISSING                           COLS. 18-23  
  
The record ID is blank and Columns 24-25 are not blank.
- h.     ERROR 1B CODE WORD NUMBER                        COLS. 24-25  
  
There is information in the record ID, Columns 18-23, but Columns 24 and 25 are zero or blank.

- i. ERROR 1B CODE MODE INDIC. COL. 26  
The retrieval mode is not indicated as B, C, W, or blank.
- j. ERROR 1B CODE FLD. ST. POS. COLS. 27-28  
There is information in the record ID and the retrieval code is B or C but Columns 27 and 28 are zero or blank.
- k. ERROR 1B CODE NO. OF UNITS COLS. 29-30  
There is information in the record ID and the retrieval code is a B or C but Columns 29 and 30 are zero or blank.
- l. ERROR 1B TOO MANY DATA UNITS COLS. 27-30  
For the field start position, Columns 27-28, if the retrieval code is C this value should be in the range of 1 to 6. If the code is B, it should be in the range of 1 to 36. For the number of units, Columns 29-30, if the retrieval code is C this value should be in the range of 1 to 6. If the code is B this value added to the field start position should be a number equal to or less than 37.
- m. ERROR 1B VAR. REC. INDIC. COL. 31  
This column does not contain a V indication or a blank.
- n. ERROR 1B VAR. REC. WORD NO. COLS. 32-33  
There is a "V" in Column 31 and these columns are blank or zero.
- o. ERROR 1B VAR. REC. MODE COL. 34  
The retrieval mode is not indicated as a B, C, W or blank.
- p. ERROR 1B VAR. FLD. START POS. COLS. 35-36  
When there is a "V" in Column 31 and the retrieval code is B or C but these columns are zero or blank.
- q. ERROR 1B VAR. NO. OF UNITS COLS. 37-38  
There is a "V" in Column 31 and the retrieval code is B or C but these columns are zero or blank.

r. ERROR 1B TOO MANY DATA UNITS COLS. 35-38

For the field start position, Columns 35-36, if the retrieval code is C this value should be in the range of 1 to 6. If the code is B it should be in the range of 1 to 36. For the number of units, Columns 37-38, if the retrieval code is C this value should be in the range of 1 to 6. If the code is B this value added to the field start position should be a number equal to or less than 37.

s. ERROR 1C FIELD CODE COLS. 3-4

An error exists on the field code of the 1C type of card if these columns are blank, zero, duplicated, or out of sequence.

t. ERROR 1C RECORD TYPE COL. 5

The record type is not in the range of 1 to 7.

u. ERROR 1C WORD POS. IN REC. COLS. 6-8

The word position value is either blank or zero.

v. ERROR 1C RETRIEVAL MODE COL. 9

The retrieval mode is not indicated as B, C, or W.

w. ERROR 1C FIELD START POS. COLS. 12-13

The retrieval code is B or C and these columns contain either a blank or a zero.

x. ERROR 1C NO. OF UNITS COLS. 14-15

The retrieval code is B, C, or W and these columns contain either a blank or a zero.

y. ERROR 1C TOO MANY DATA UNITS COLS. 12-15

For the field start position, Columns 12-13, if the retrieval code is C this value should be in the range of 1 to 6. If the code is B it should be in the range of 1 to 36. For the number of units, Columns 14-15, if the retrieval code is B this value added to the field start position should be a number equal to or less than 37.

z. ERROR 1C FORMAT MODE COL. 16

This mode is not indicated by a B, D, W, T, F, C, K, or a blank.

aa. ERROR 1C DATE SUB-MODE COL. 17

If the format mode, Column 16, is a D this field should be in the range of 1 to 6. If it contains a T or K this field should be in the range of 0 to 7.

ab. FILE BEING ESTABLISHED WITH NO. 1 CARD INPUT

There is No. 1 card input for a file establishment that uses time data.

The above messages will all be followed with an 80-character reproduction of the input card creating the error.

#### Time Merge Input Parameter Restrictions

Although this system is flexible with respect to the format of the USERS TIME TAPE, there are certain minimum requirements that must be met. These requirements are:

1. The tape must be compatible with IBM 7090 data processing equipment.
2. The tape must contain, as a minimum, those elements of PERT Time data which are considered to be both necessary and sufficient for a successful computer run. These elements are:
  - a) Start or base date
  - b) Predecessor and successor number
  - c)  $S_E$  or  $T_E$
  - d)  $S_L$  or  $T_L$
  - e)  $T_S$
  - f)  $T_A$
  - g)  $t_s$  or  $t_e$
3. The tape must contain activity-oriented PERT Time data. Explicitly, the computed values ( $T_E$ ,  $T_L$ ,  $S_E$ ,  $S_L$ , and slack) must be related to an activity or to the succeeding event of an activity.



4. All of the PERT Time data must be contained on a single tape. The system does not have the capability of reading multiple PERT time tapes.
5. If any of the fields contain information carried in the binary mode, this information must be carried within (or up to) a full computer word. It is not acceptable to have binary information split between two computer words.

#### Time Merge Input Parameter Table Layouts

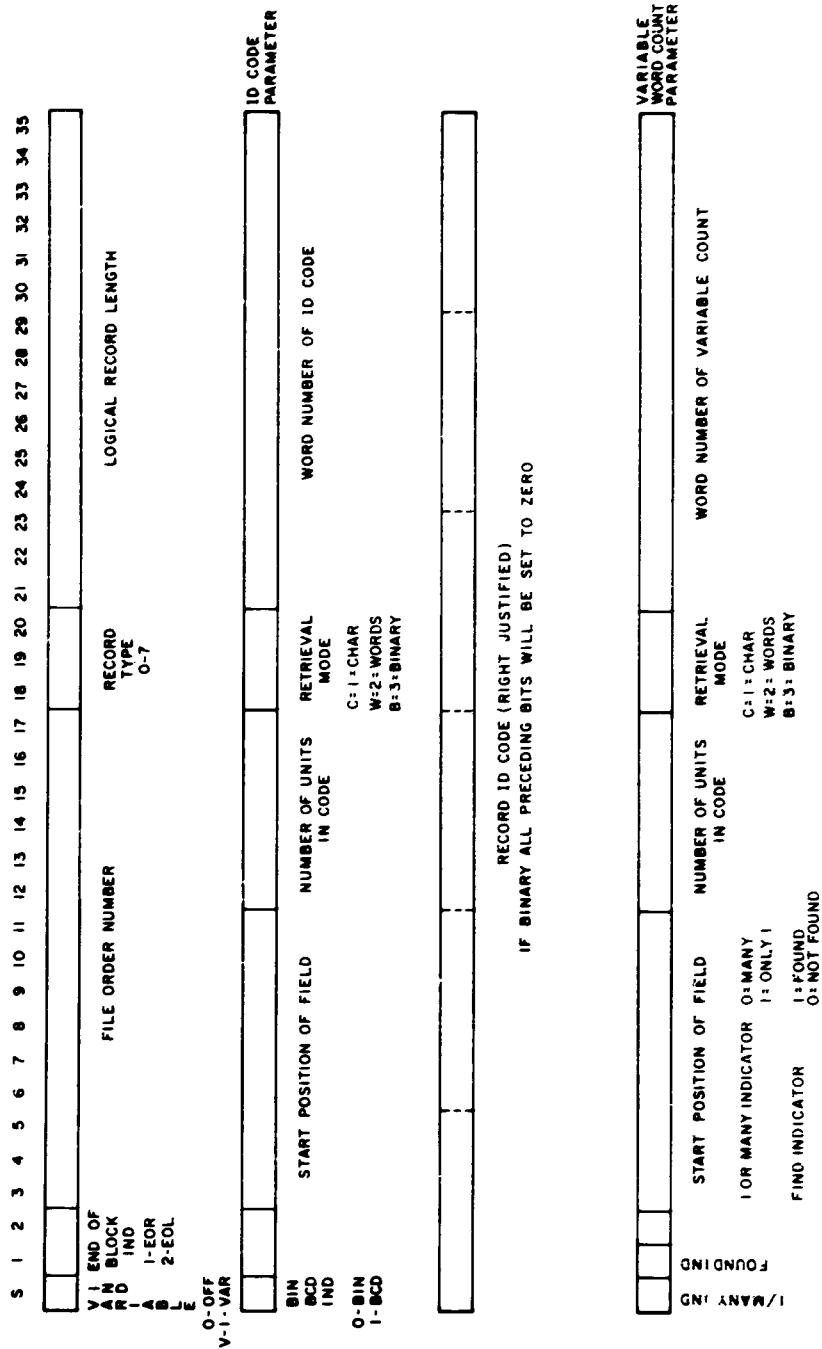
The following table layouts will illustrate the manner in which the INPAR table has been constructed in core and is carried on tape. (Fig. III-F-1) indicates the fields that were described on Page III-F-4. This figure is the actual input form used, and will allow for up to 15 "1B" cards on this form. The information from this form is translated card by card into the INPAR table area. This table area is located from INPAR + 10 to INPAR + 309 and each card is set into a 4-word block (Fig. III-F-2). Each of these 4-word blocks will follow the previous block until all of the "1B" cards have been completed. The balance of the file description portion of the INPAR table will be zeros. Up to 75 "1B" cards can be set into the INPAR table.

Figure III-F-3 also will indicate fields that were described on Page III-F-7. This figure is the actual input form used, and allows for the input of "1A" and "1C" cards from this form. For the "1A" cards the input is translated field by field and set into its proper location in INPAR + 0 to INPAR + 9. All unused locations in INPAR, or blank fields on the input card, will result in zeros being set into the table. (Figure III-F-5) will show the placement of the "1A" data into the INPAR table.) The information from the "1C" card is translated field by field and card by card into the INPAR table. This table area is located at INPAR + 310 to INPAR + 349 and each card is set into a 2-word block (Figure III-F-4). Each of these 2-word blocks will be set into its respective location according to the card number related to the input. Only those fields that are described by "1C" cards will have information in the INPAR table. All other fields that have not been described will have zeros in their respective locations in this table. INPAR + 346 to +349 will always contain zeros.

Figure 3.5.6-5 shows the entire INPAR table layout and the information contained within. The first of a set of file description blocks is shown in detail at INPAR + 10 to INPAR + 13. All following 4-word blocks will duplicate the first, in form, up to a maximum of 75. The same is true for the field description blocks, in that it is detailed at INPAR + 310 to INPAR + 311 and this form is duplicated by all field descriptions that follow it. Each of the fields is shown opposite the first word of its respective 2-word block.

| CARD<br>CODE | CARD<br>NUMBER | FILE<br>NUMBER | RECORD<br>TYPE | RECORD<br>INDICATOR | LENGTH<br>OF<br>LOGICAL<br>RECORD | READ<br>MODE | END OF<br>BLOCK<br>CODE | RECORD ID | WORD<br>POSITION<br>IN<br>RECORD<br>FOR ID | RETRIEVAL<br>CODE FOR<br>ID | FIELD<br>START<br>POSITION<br>FOR ID | NUMBER<br>OF UNITS<br>FOR ID | WORD<br>POSITION<br>IN<br>RECORD<br>FOR VAR. | RETRIEVAL<br>CODE FOR<br>VAR. IND. | FIELD<br>START POS.<br>FOR VAR. | NUMBER OF<br>UNITS FOR<br>VAR. IND. |    |    |    |    |    |    |    |    |    |    |    |    |
|--------------|----------------|----------------|----------------|---------------------|-----------------------------------|--------------|-------------------------|-----------|--------------------------------------------|-----------------------------|--------------------------------------|------------------------------|----------------------------------------------|------------------------------------|---------------------------------|-------------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|
| 1            | 23             | 45             | 6              | 7                   | 8                                 | 9            | 11                      | 12        | 14                                         | 15                          | 17                                   | 18                           | 23                                           | 24                                 | 25                              | 26                                  | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |
| 1 B          |                |                |                |                     |                                   |              |                         |           |                                            |                             |                                      |                              |                                              |                                    |                                 |                                     |    |    |    |    |    |    |    |    |    |    |    |    |

Fig. III-F-1 Tape Record and File Description Block





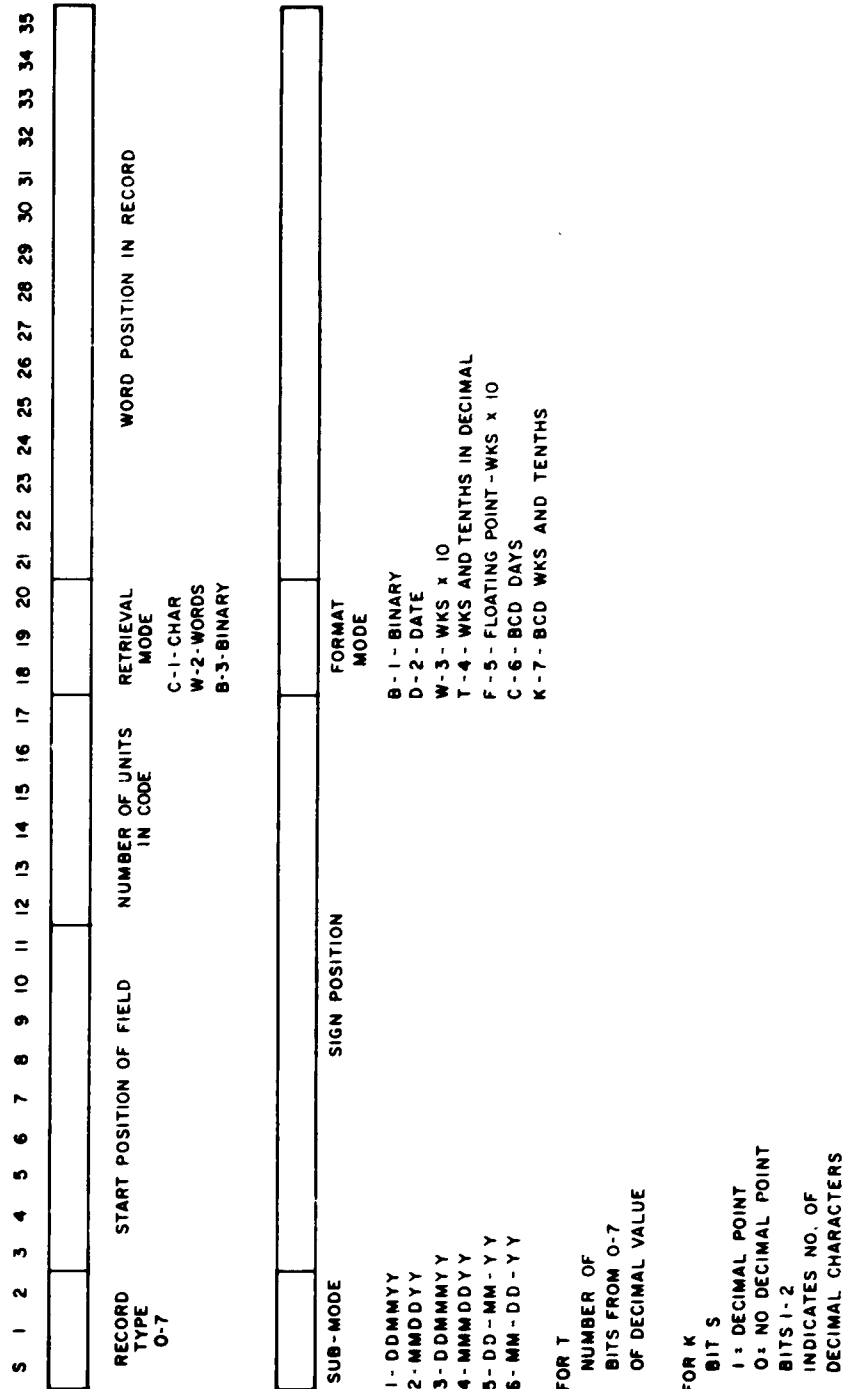


Fig. III-F-4 Breakdown of Input Parameter Field Description Blocks

|                             |      | BITS                                                                                                         |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|-----------------------------|------|--------------------------------------------------------------------------------------------------------------|---|----------------------------|---|--------------------------|----|----------------------------|----|----------------------------|----|----|----|----|----|--|--|-------------|--|--|--|--|
|                             |      | 5                                                                                                            | 2 | 3                          | 6 | 9                        | 12 | 15                         | 18 | 21                         | 24 | 27 | 30 | 33 | 35 |  |  |             |  |  |  |  |
| INPAR                       | +    |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
| SORT REQUIRED INDICATOR     | +0   | 0 - SORT NOT REQUIRED<br>1 - SORT REQUIRED                                                                   |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
| NETWORK BASE DATE           | +1   | D                                                                                                            |   |                            |   | D                        |    |                            |    | M                          |    |    |    | M  |    |  |  | Y           |  |  |  |  |
|                             | +2   | Y                                                                                                            |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
| TIME ON BASE OR START       | +3   | 1 - CALCULATIONS USING BASE DATE<br>2 - CALCULATIONS USING START DATE                                        |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
| T <sub>0</sub> CODE IN FILE | +4   |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  | ACTUAL CODE |  |  |  |  |
|                             | +5   | 0 - T <sub>0</sub> & T <sub>0</sub> SAME LOCATION<br>1 - T <sub>0</sub> & T <sub>0</sub> DIFFERENT LOCATIONS |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +6   |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +7   |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +8   |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +9   |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
| INPAR                       | +10  | FILE ORDER NO                                                                                                |   | RECORDS<br>TYPE            |   | LOGICAL RECORD<br>LENGTH |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
| ID CODE LOCATOR             | +11  | START POSITION<br>OF FIELD                                                                                   |   | NO OF<br>UNITS             |   | RECORD<br>MODE           |    | WORD POSITION<br>IN RECORD |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
| ID CODE (6 CHAR MAX)        | +12  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
| VARIABLE COUNT LOCATOR      | +13  | START POSITION<br>OF FIELD                                                                                   |   | NO OF<br>UNITS             |   | RECORD<br>MODE           |    | WORD POSITION<br>IN RECORD |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +14  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +15  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +16  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +17  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +18  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +19  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +20  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +21  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +22  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +23  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +24  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +25  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +26  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +27  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +28  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +29  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +30  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +31  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
| NETWORK CODE                | +32  | RECORD<br>TYPE                                                                                               |   | START POSITION<br>OF FIELD |   | NO OF<br>UNITS           |    | RECORD<br>MODE             |    | WORD POSITION<br>IN RECORD |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +33  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
| NETWORK DESCRIPTION         | +34  | DATE<br>SUB<br>MODE                                                                                          |   | SIGN POSITION              |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +35  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +36  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +37  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +38  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +39  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +40  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +41  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +42  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +43  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +44  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +45  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +46  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +47  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +48  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +49  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +50  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +51  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +52  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +53  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +54  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +55  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +56  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +57  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +58  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +59  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +60  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +61  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +62  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +63  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +64  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +65  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +66  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +67  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +68  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +69  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +70  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +71  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +72  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +73  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +74  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +75  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +76  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +77  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +78  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +79  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +80  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +81  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +82  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +83  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +84  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +85  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +86  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +87  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +88  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +89  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +90  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +91  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +92  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +93  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +94  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +95  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +96  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +97  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +98  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +99  |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +100 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +101 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +102 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +103 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +104 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +105 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +106 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +107 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +108 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +109 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +110 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +111 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +112 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +113 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +114 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +115 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +116 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +117 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +118 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +119 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +120 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +121 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +122 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +123 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +124 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |
|                             | +125 |                                                                                                              |   |                            |   |                          |    |                            |    |                            |    |    |    |    |    |  |  |             |  |  |  |  |

CONTINUED

Fig III-F-5 Input Parameter Block

|                                                   |       | BITS           |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
|---------------------------------------------------|-------|----------------|-------------------------|---|---|---|-------------|----|----|----|---------------|----|----|----|-----------|--|--|
|                                                   |       | 5              | 2                       | 3 | 6 | 9 | 12          | 15 | 18 | 21 | 24            | 27 | 30 | 33 | 35        |  |  |
| S <sub>L</sub>                                    | + 326 | RECORD TYPE    | START POSITION OF FIELD |   |   |   | NO OF UNITS |    |    |    | WORD POSITION |    |    |    | IN RECORD |  |  |
|                                                   | + 327 | DATE TIME MODE | SIGN POSITION           |   |   |   |             |    |    |    | NUMBER MODE   |    |    |    |           |  |  |
| T <sub>L</sub>                                    | + 328 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
|                                                   | + 329 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
| T <sub>B</sub> OR T <sub>S</sub> / T <sub>A</sub> | + 330 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
|                                                   | + 331 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
| t <sub>2</sub>                                    | + 332 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
|                                                   | + 333 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
| t <sub>3</sub>                                    | + 334 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
|                                                   | + 335 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
| SLACK                                             | + 336 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
|                                                   | + 337 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
| ACTIVITY DESCRIPTION                              | + 338 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
|                                                   | + 339 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
| SCHEDULED/ACTUAL FLAG                             | + 340 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
|                                                   | + 341 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
| CHARGE NUMBER                                     | + 342 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
|                                                   | + 343 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
| T <sub>0</sub>                                    | + 344 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
|                                                   | + 345 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
|                                                   | + 346 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
|                                                   | + 347 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
|                                                   | + 348 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
|                                                   | + 349 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |
|                                                   | + 349 |                |                         |   |   |   |             |    |    |    |               |    |    |    |           |  |  |

CONTINUATION  
OF INPUT  
PARAMETER  
FIELD  
DESCRIPTION

CONTINUATION  
OF INPUT  
PARAMETER  
FIELD  
DESCRIPTION

Fig III-F-5 Input Parameter Block (Continued)



### Time Merge Input Parameter Region Descriptions

The following region description describes the input parameter subroutine used in the time merge phase of the program.

### Region PMSU

#### EXPLANATION OF REGION:

This region will translate the input parameters into a table called INPAR and write it out on the NEW SECONDARY MASTER TAPE.

#### CALLING SEQUENCE:

L      TSX    PMSU, 4

L + 1   Normal return

#### INPUT:

SORTED DATA TAPE (Input Type Number 1)

OLD SECONDARY MASTER TAPE

#### OUTPUT:

The INPAR table developed in core and set out on the NEW SECONDARY MASTER TAPE

#### STORAGE USED:

INPAR   - 350 words - table location

HUNPK   - 81   words - input card storage locations

HMKUP   - 4   words - block makeup area (for both file and field blocks)

#### SUBREGIONS AND SUBROUTINES USED:

PACK

RCHG

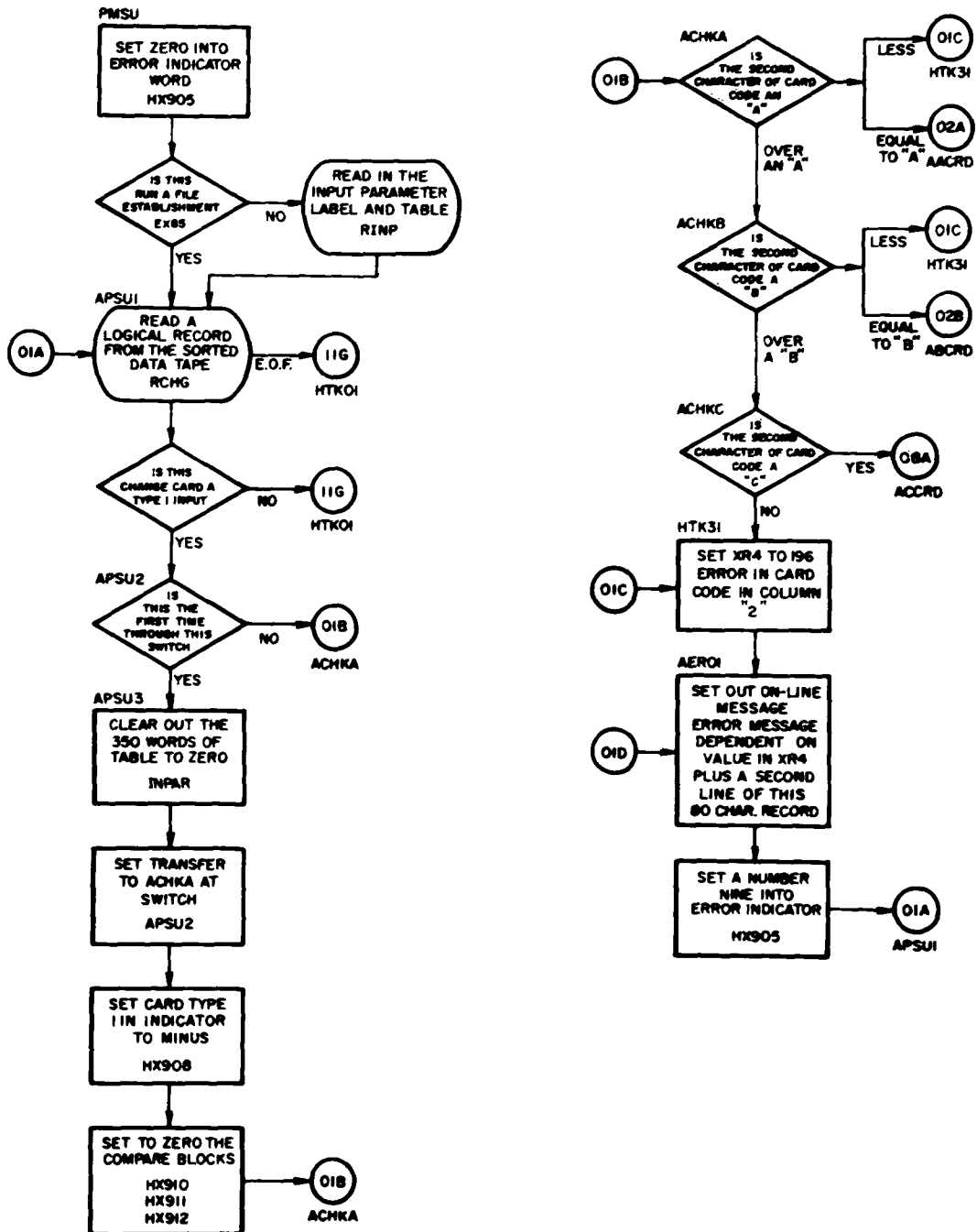
UPCK

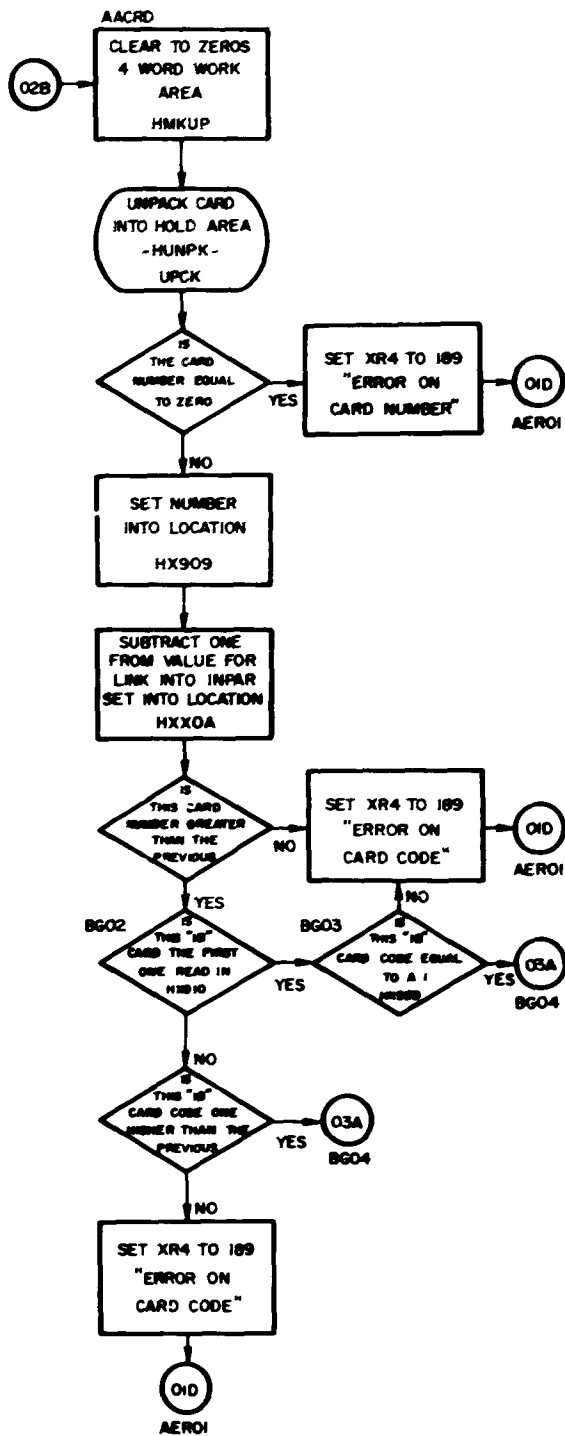
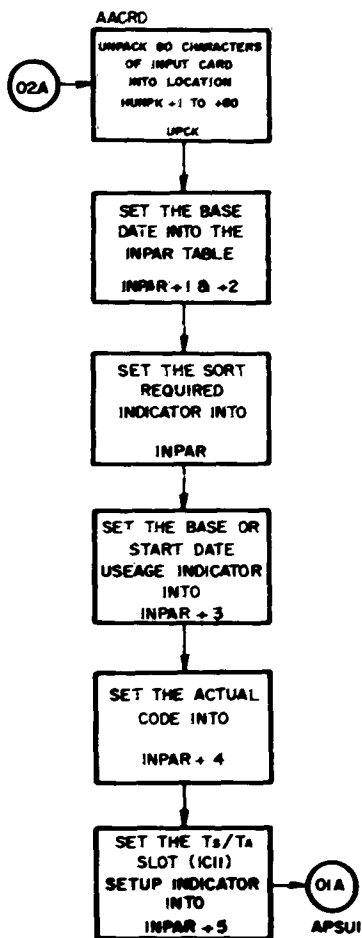
#### EXPLANATION OF CALLING SEQUENCE:

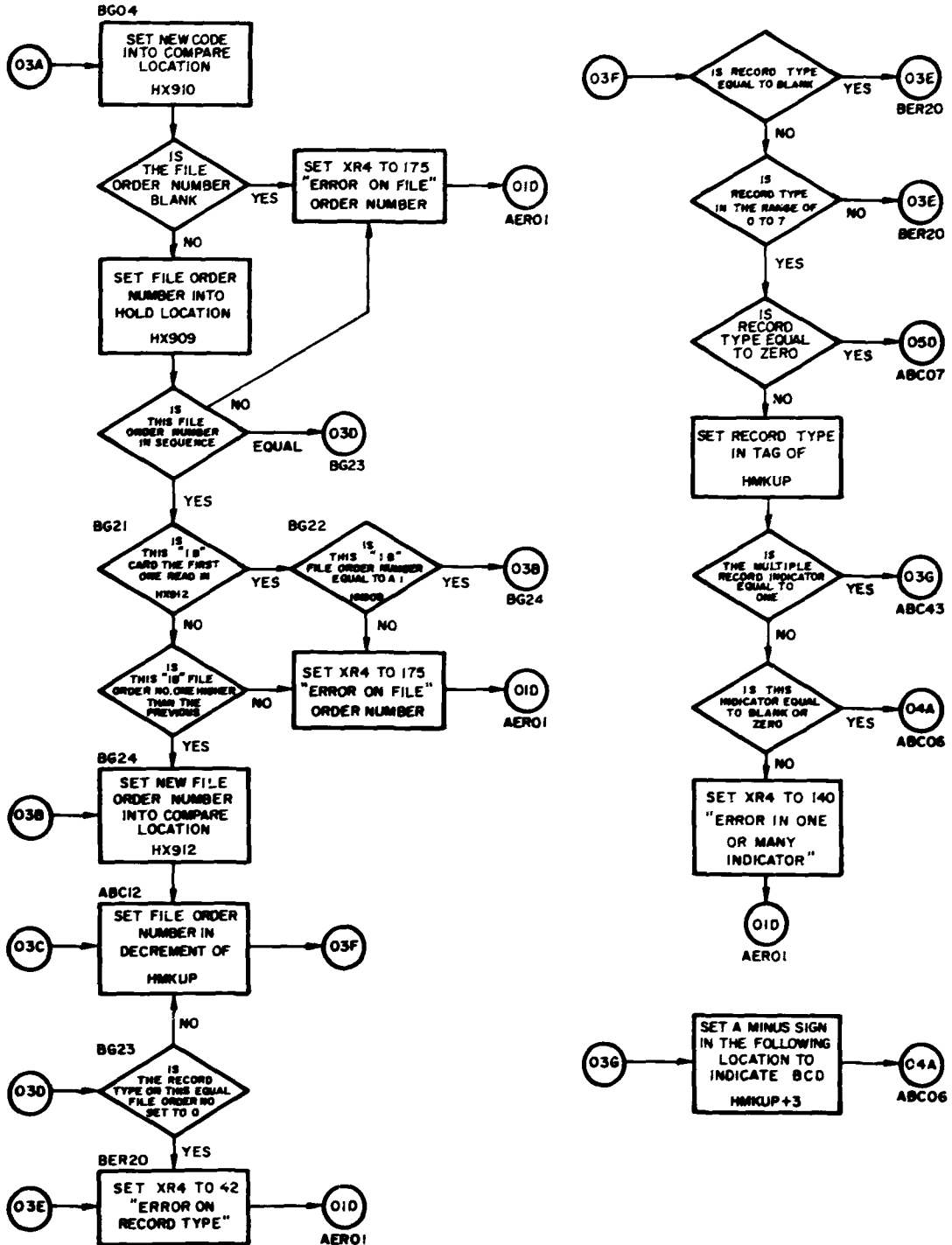
If an error is determined in developing this table, a message is set out on the on-line printer and the program will bring in the next card to translate. When all type 1 cards are completed and one or more errors have been found, the program will stop. If no errors are determined, the program will go to its normal return.

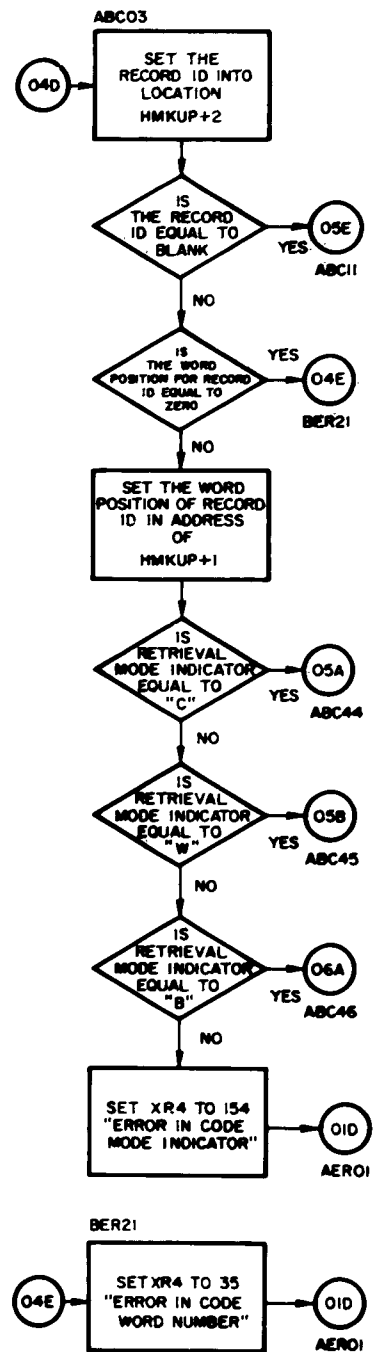
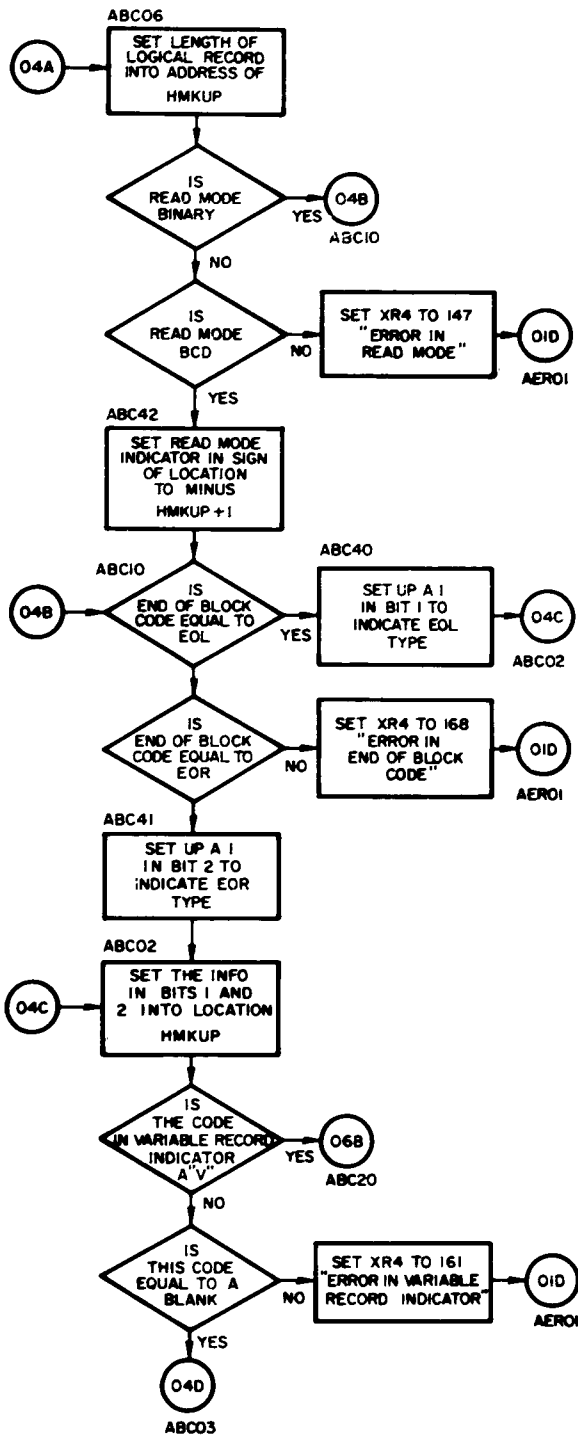
# REGION PMSU

## INPUT PARAMETER TABLE SETUP ROUTINE









```

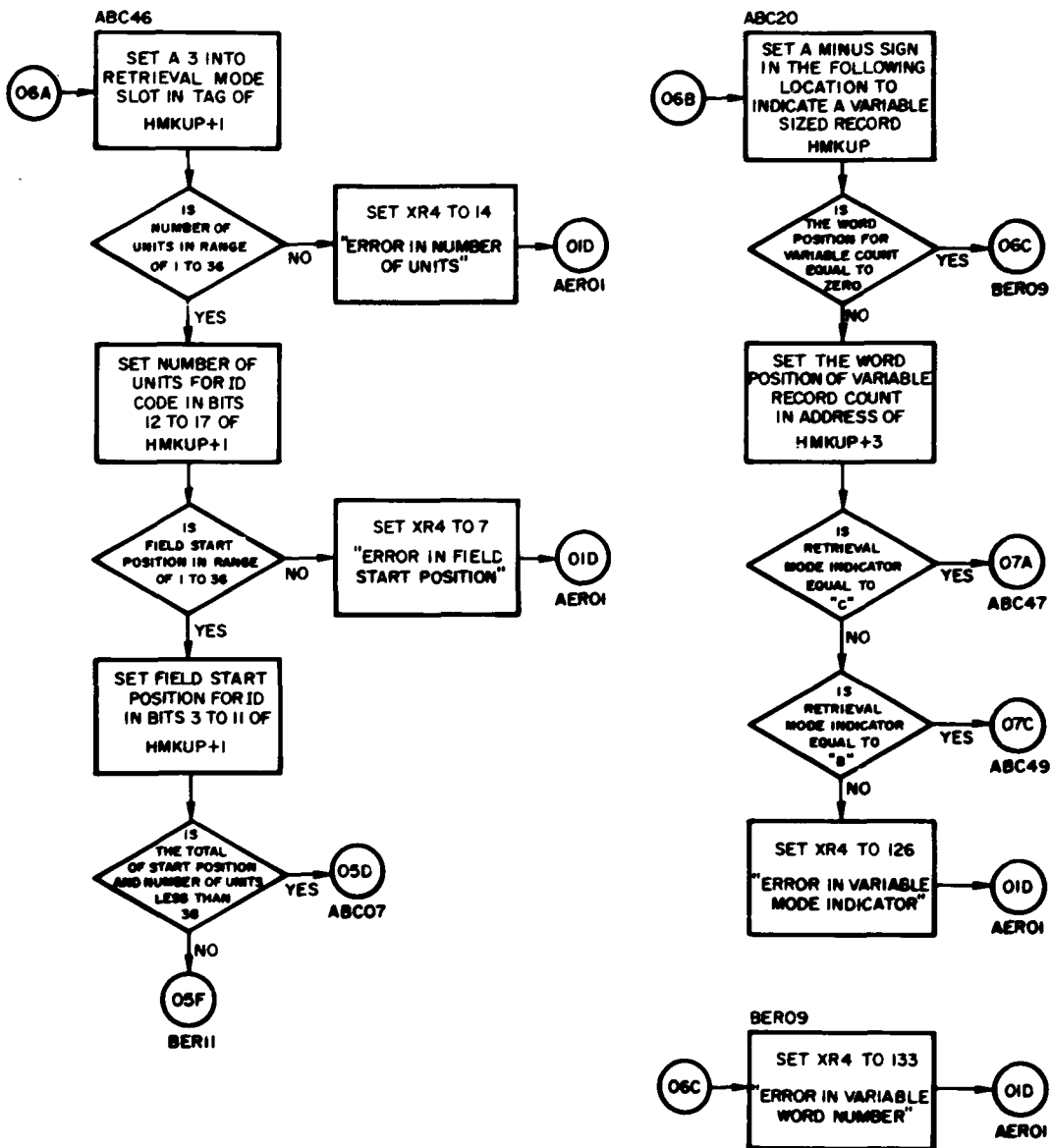
graph TD
 subgraph ABC44
 O5A((O5A)) --> ABC44[SET A 1 INTO
RETRIEVAL MODE
SLOT IN TAG OF
HMKUP+1]
 ABC44 --> D1{IS
NUMBER OF
UNITS IN RANGE
OF 1 TO 6}
 D1 -- NO --> ABC44_1[SET XR4 TO 14
"ERROR IN
NUMBER OF UNITS"]
 ABC44_1 --> O1D((O1D))
 O1D --> AEROI[AEROI]
 D1 -- YES --> ABC44_2[SET NUMBER OF
UNITS FOR ID
CODE IN BITS
12 TO 17 OF
HMKUP+1]
 ABC44_2 --> D2{IS
FIELD START
POSITION IN RANGE
OF 1 TO 6}
 D2 -- NO --> ABC44_3[SET XR4 TO 7
"ERROR IN FIELD
START POSITION"]
 ABC44_3 --> O1D
 O1D --> AEROI
 D2 -- YES --> ABC44_4[SET FIELD START
POSITION FOR ID
IN BITS 3 TO 11 OF
HMKUP+1]
 ABC44_4 --> D3{IS THE TOTAL
OF START POSITION
AND NUMBER OF UNITS
LESS THAN
13}
 D3 -- YES --> O5D((O5D))
 O5D --> ABC07[ABC07]
 D3 -- NO --> BER11[BER11]
 BER11 --> ABC44_5[SET XR4 TO 119
"TOO MANY DATA
UNITS"]
 ABC44_5 --> O1D
 O1D --> AEROI
 end

 subgraph ABC45
 O5B((O5B)) --> ABC45[SET A 2 INTO
RETRIEVAL MODE
SLOT IN TAG OF
HMKUP+1]
 ABC45 --> O5C((O5C))
 O5C --> ABC04[ABC04]
 end

 subgraph ABC04
 O5C --> ABC04_1[SET NUMBER OF
UNITS FOR ID
IN BITS 12-17 OF
HMKUP+1]
 ABC04_1 --> ABC07[ABC07]
 ABC07 --> ABC04_2[DETERMINE
LOCATION IN
INPAR TABLE
TO PLACE THIS 4
WORD "18" BLOCK]
 ABC04_2 --> ABC09[ABC09]
 ABC09 --> ABC04_3[MOVE THIS 4
WORD BLOCK AT
HMKUP TO
INPAR TABLE]
 ABC04_3 --> O1A((O1A))
 O1A --> APSUI[APSUI]
 end

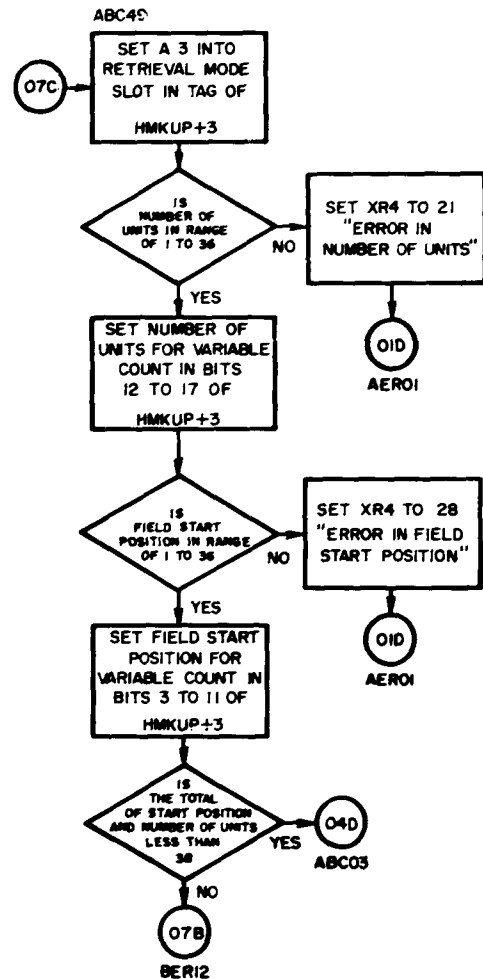
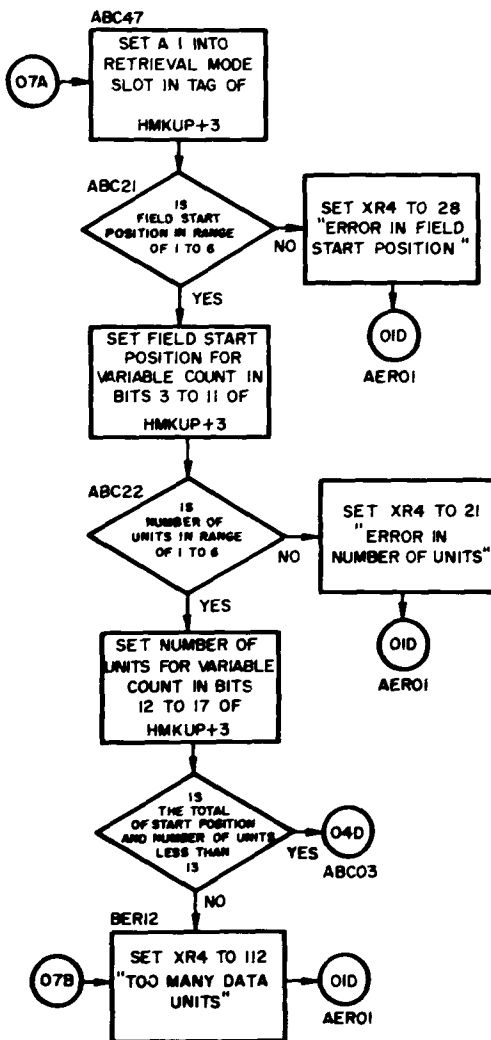
 subgraph ABC07
 O5E((O5E)) --> ABC07_1[SET RECORD ID
BLOCK TO 0
HMKUP+2]
 ABC07_1 --> D4{IS
WORD POSITION
IN RECORD FOR ID
EQUAL TO BLANK}
 D4 -- YES --> O5D
 O5D --> ABC07
 D4 -- NO --> ABC07_2[SET XR4 TO 182
"RECORD ID
MISSING"]
 ABC07_2 --> O1D
 O1D --> AEROI
 end

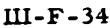
```



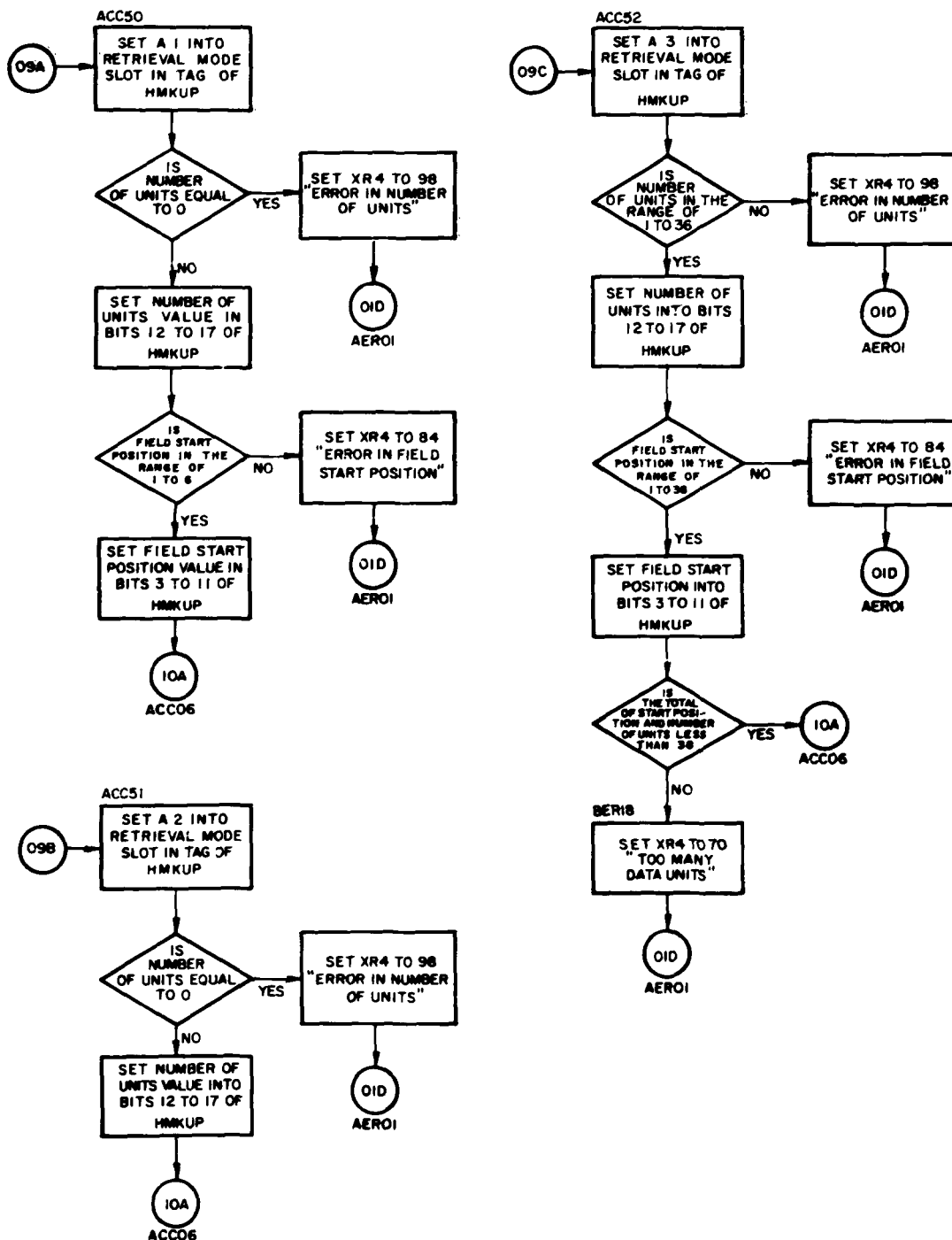


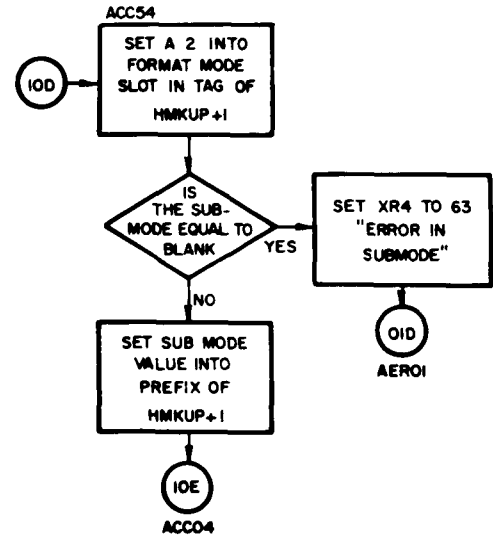
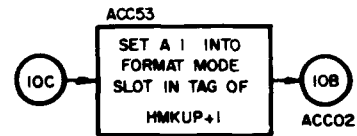
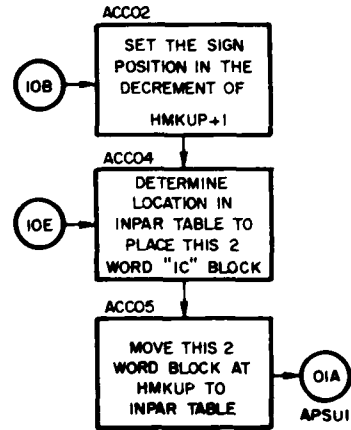
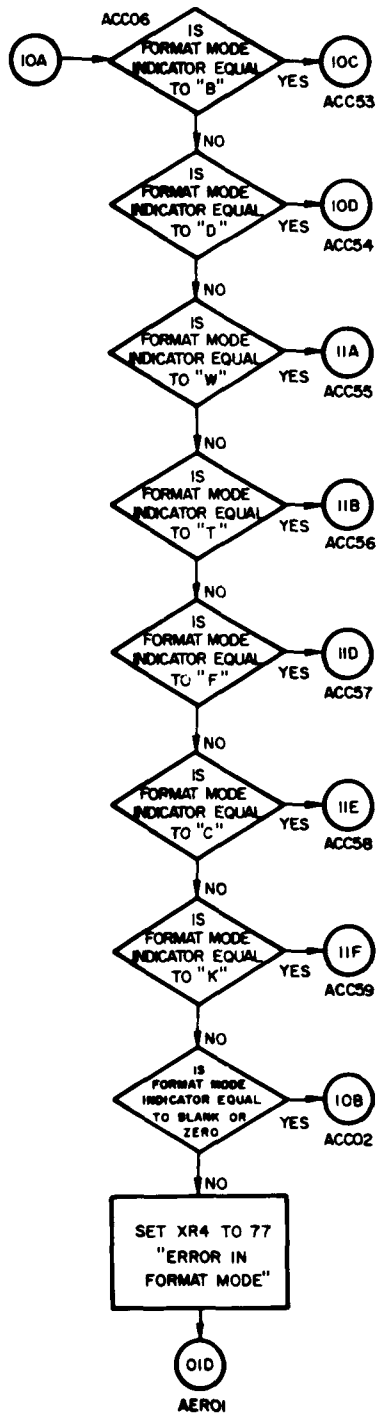
REGION PMSU



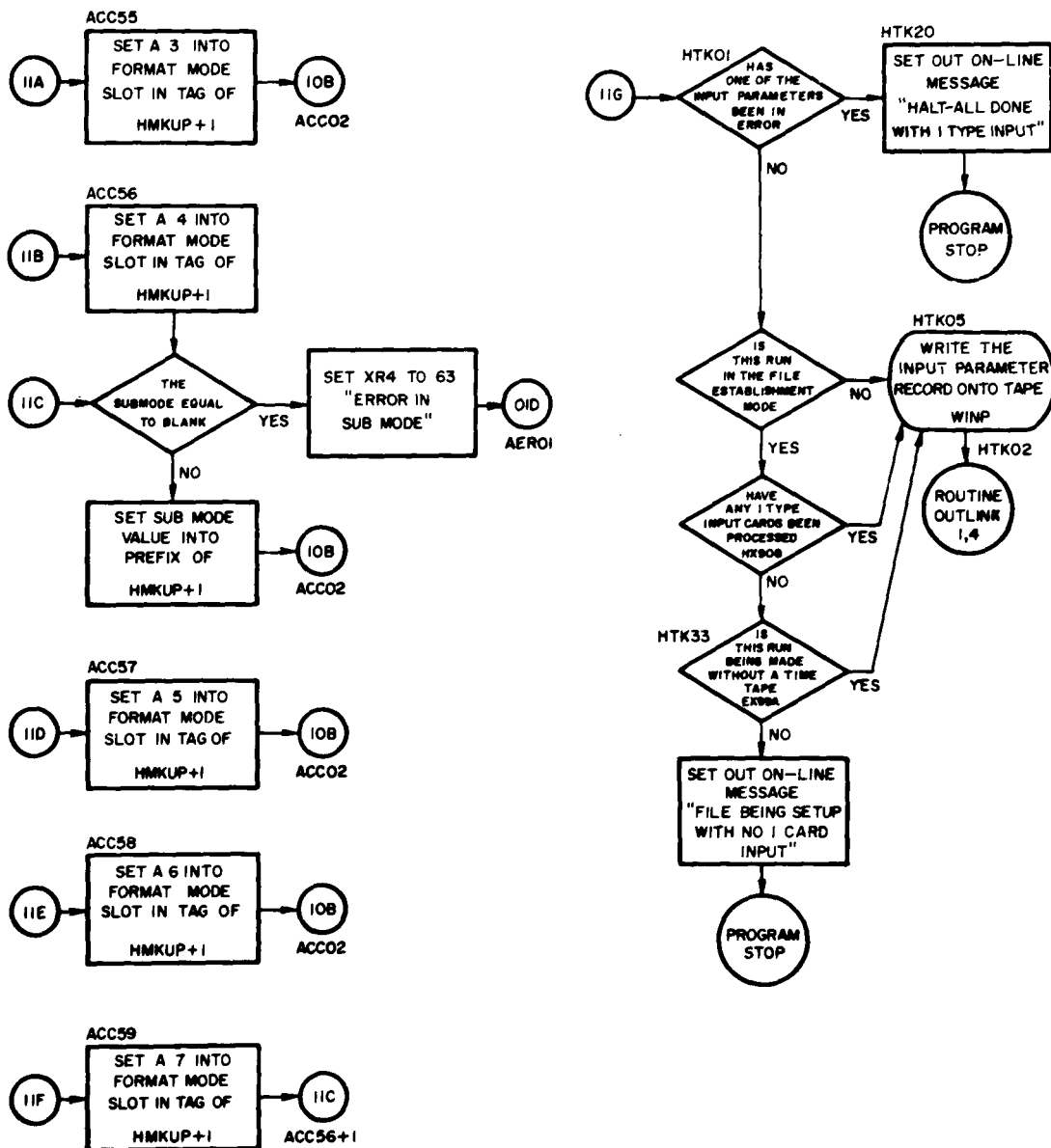


REGION PMSU





REGION PMSU



### Time Merge Phase Tape Operations

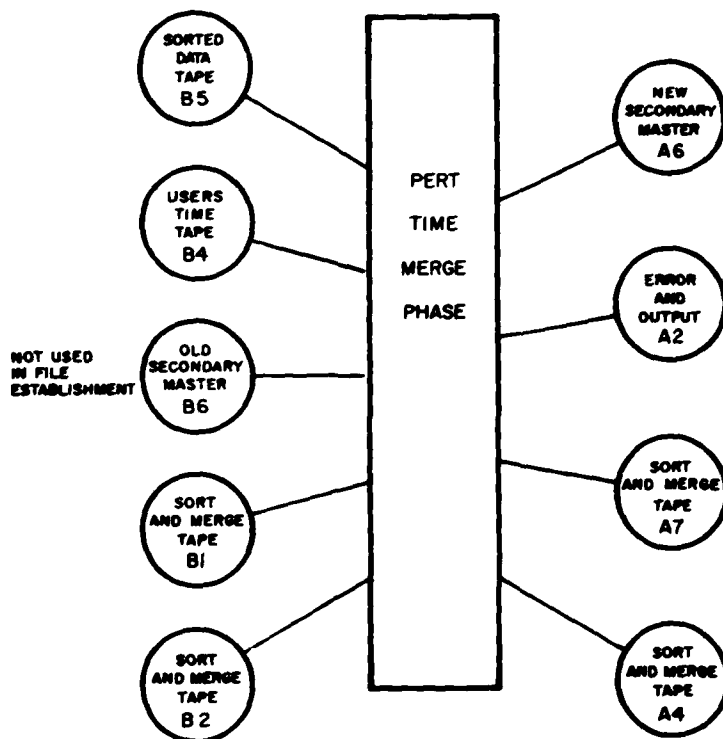
After the creation or bringing in of the input parameter table the Type 2 input cards are read in off the sorted input tape. If this is a file establishment run, the activity-to-charge-number information is developed from this data. This information is then stored on the NEW SECONDARY MASTER TAPE. If this is not a file establishment run, the Type 2 input cards will update the data on the OLD SECONDARY MASTER TAPE and then set the new data on the NEW SECONDARY MASTER TAPE. It is possible that there would be no Type 2 cards on an update run, and the data from the old tape would be set directly onto the new tape.

If one of the elements of data on the USERS TIME TAPE is the charge number, this could preclude any Type 2 input. In this case the merge function of this phase would be basically bypassed and the time record, after development by means of the input parameters, would be set out onto the sort tapes if the time record contained a charge number. For this situation the secondary master tape would not contain any activity-to-charge-number information but would have a pseudo record. This record would contain only a label and an end-of-file in order to use the normal program reads and writes. It is possible to have activity-to-charge-number inputs on the Secondary Master for the above situation. In this case the input data would then override any conflict of charge numbers for an activity.

A maximum of nine reels of the OLD SECONDARY MASTER TAPE can be read and up to nine reels of the NEW SECONDARY MASTER TAPE can be written. If any errors occur during the time merge processing, they will be set out on the SYSTEM ERROR TAPE. At the end of the merge phase and just prior to entering the activity-to-charge-number sort, the messages described on Page III-F-2 would be set out. If it is judged that the program

cannot continue because of the volume or type of errors, the SYSTEM ERROR TAPE is printed out. After correcting the problem the program is then re-started from the beginning.

The tape flow during the time merge phase will take the following form, which is the normal tape configuration used during the time merge phase. The tape operations are described below.



#### Tape Operation When Users Time Tape is to be Sorted

The USERS TIME TAPE is read into the system by means of the INPAR table and as each record is formed it is set out onto the sort and merge tapes A4 and A7. At the completion of the USERS TIME TAPE the 4-tape sort (see Subsec. 4.2) is operated, using tapes A4, A7, B1, and B2. When the last pass is to be completed in the merge phase, the control is returned to the program and the PERT time data is read into the system from the A or the B bank, depending on the number of passes. This data is now in

PE-SE sequence and can be merged with the charge numbers, which are also in PE-SE sequence and are stored on the OLD SECONDARY MASTER TAPE B6. The charge numbers in PE-SE sequence can be updated during this processing from data stored on the SORTED DATA TAPE B5. After which the merged activity/charge number data are set onto the NEW SECONDARY MASTER TAPE A6. During this processing of the data, the time records that are tied to a charge number are set out onto the 4-tape sort on the side opposite from which the PERT Time data is read. At the completion of the time merge phase the 4-tape sort is operated again, using tapes A4, A7, B1, and B2. This sort will set the time information into charge number sequence. The last phase of this sort is tied to the update phase (see Subsec III-G).

#### Tape Operation when USERS TIME TAPE is in PE-SE or SE-PE Sequence

The USERS TIME TAPE is read into the system by means of the INPAR table, and as each record is formed it is merged with the charge numbers which also are in PE-SE or SE-PE sequence. The charge numbers in activity sequence will be read in from the OLD SECONDARY MASTER TAPE B6, updated by input from the SORTED DATA TAPE B5, and set out on the NEW SECONDARY MASTER TAPE A6. During the processing of this data, the time records that are tied to a charge number are set out onto the 4-tape sort on tapes A7 and A4. At the completion of the time merge phase, the sort is operated using A4, A7, B1, and B2 as merge tapes. This sort will set the time information into charge number sequence for the update phase.

#### Tape Operation During Option G

During Option G the time merge phase is virtually bypassed, in that there is no Type 1 or Type 2 input data and no USERS TIME TAPE. The only operation performed during this phase under this option is a tape duplication operation for the SECONDARY MASTER. The input parameter records and labels and the SECONDARY MASTER data and its labels are duplicated from the OLD SECONDARY MASTER TAPE to the NEW SECONDARY



MASTER TAPE. The only exception to the duplication of this data is the program name, if it has been changed during this run. After this duplication is completed the program will go into the update phase.

#### Time Merge Phase On-Line Messages

The messages forthcoming on the on-line printer regarding the tapes used in the time merge phase will be:

(a) For File Establishment in Option D or F

TAPE B5 HAS BEEN SELECTED FOR READING  
TAPE B4 HAS BEEN SELECTED FOR READING  
TAPE A6 HAS BEEN SELECTED FOR WRITING  
TAPE B4 IS NOW REWINDING AND SHOULD UNLOAD  
END OF PERT COST TIME MERGE PHASE

The above set of messages will be followed by the error indication messages described in Subsec. 3.5.1. This will hold true for all of the examples below. After the error indication messages, the following two lines will also be set out on the on-line printer for examples (b), (c), and (d) below.

COMPLETED WRITING OF NEW SECONDARY TAPE A6  
\*\*\*DO NOT REWIND\*\*\*

(b) For Regular Cyclic Runs in Option D or F

TAPE B5 HAS BEEN SELECTED FOR READING  
TAPE B4 HAS BEEN SELECTED FOR READING  
TAPE B6 HAS BEEN SELECTED FOR READING  
TAPE A6 HAS BEEN SELECTED FOR WRITING  
TAPE B4 IS NOW REWINDING AND SHOULD UNLOAD  
COMPLETED READING OF OLD SECONDARY TAPE B6  
\*\*\*DO NOT REWIND\*\*\*  
END OF PERT COST TIME MERGE PHASE

If more than one OLD SECONDARY MASTER TAPE or NEW SECONDARY MASTER TAPE is used, the following messages will be inserted at the point the tape hits end-of-file or end-of-tape.

TAPE XX IS NOW REWINDING AND SHOULD UNLOAD  
SET NEXT REEL OF THIS SERIES ON TAPE XX

If this tape is the old master, the next reel will indicate the next tape that was created subsequent to the one that is now rewinding. If this tape is the new master, the next reel will indicate a blank or scratch tape. The program will hold up at this point until the tapes are rewound and unloaded, and a new tape is set on for processing.

(c) For Regular Cyclic Runs in Option G

TAPE B6 HAS BEEN SELECTED FOR READING  
TAPE A6 HAS BEEN SELECTED FOR WRITING  
COMPLETED READING OF OLD SECONDARY TAPE B6  
\*\*\*DO NOT REWIND\*\*\*  
COMPLETED WRITING OF NEW SECONDARY TAPE B6  
\*\*\*DO NOT REWIND\*\*\*

During this option the only operation accomplished in the time merge phase is the duplication of the OLD SECONDARY MASTER TAPE onto the new. These messages refer to this operation.

(d) For Regular Cyclic Runs in Option C and E

The tape messages for Option C and E will follow the same pattern set up for D and F in (b) above except that the following tape message will take place during this phase.

TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD

In Option C and E the only input in should apply to the time data relationship and therefore the SORTED DATA TAPE should finish up in this phase.

Time Merge Phase Error Messages

The errors determined during the time merge phase are set out on the SYSTEM ERROR TAPE or the on-line printer. Any messages on the SYSTEM ERROR TAPE will not stop the processing during the time merge phase but the errors will be totaled and set out in the message described in Subsec. 3.5.1. Some of the on-line messages will stop the system, while others will contain an option to continue. A group of the on-line messages will cause no stop at all.

The errors messages that will be set out on the SYSTEM ERROR TAPE are explained below.

(a) ACTIVITY INDICATED ON SEC MASTER NOT ON USERS TAPE

An activity is located on the SECONDARY MASTER that cannot be found on the users tape. There will be one of two messages following this line, according to whether there is any Type 2 input for this activity. If there is not, the information from the SECONDARY MASTER is set out as follows in 42 characters:

Network no. -predecessor-successor-charge number

If there is Type 2 input, it will be set out as follows:

XX - 80 characters of input cards - XX

This 80-character line will also follow the messages (b), (c), and (d).

(b) CHANGE IS REQUESTED ON NON-EXISTENT ITEM IN SEC MASTER

A Type 2 input is attempting to change an activity-to-charge-number relationship on a non-existent item.

(c) ATTEMPTING TO ADD AN ACTIVITY ALREADY IN SEC MASTER

A Type 2 input is attempting to add a new activity-to-charge-number relationship on an existing item.

(d) MORE THAN ONE CHANGE INPUT FOR THIS ACTIVITY

Two input cards relating to the same activity are found during this run. The first is handled normally but the second is not operated upon at all and is set out on the SYSTEM ERROR TAPE.

(e) DUPLICATE ACTIVITIES ON SECONDARY MASTER

Two records relating to the same activity are found on the SECONDARY MASTER. The second record is removed from the NEW SECONDARY MASTER TAPE and this message plus a 42-character predecessor, successor, and charge-number message is set out.

- (f) SAME ACTIVITY APPEARS MORE THAN ONCE ON USERS TAPE

Duplicate activities are found during the time merge phase reading of the USERS TIME TAPE. A second line of 24 characters indicating network code, predecessor, and successor numbers is also set out. The system will process the first activity and ignore its duplicate.

- (g) CANNOT LOCATE MONTH XXX LN NN

When a field in the USERS TIME TAPE contains an alphabetic 3-character month which is not legitimate, this message is set out with the bad month located at the XXX positions. The LN number in this message will refer to the field involved and relates to the input parameter "LC" card numbers. A second line of 24 characters indicating network code, predecessor, and successor numbers is also set out.

The following error messages will be set out on the on-line printer, and will stop the system.

- (h) A TYPE 1 CARD FOUND AFTER PARAMETER SETUP

During the reading of the Type 2 cards a Type 1 input parameter card was found. The SORTED DATA TAPE is out of sequence.

- (i) FIRST RECORD ON SEC MASTER NOT NETWORK CODE

The first record found on the SECONDARY MASTER was not a network code record.

- (j) CHANGE INPUT OUT OF SEQUENCE

CURRENT (network no. -predecessor-successor)

NEW (XX - 80 characters of input card - XX)

When the input from the SORTED DATA TAPE is not in sequence the above messages are set out, indicating the two sequence checking fields.

- (k) SECONDARY MASTER OUT OF SEQUENCE

CURRENT (network no. -predecessor-successor)

NEW (network no. -predecessor-successor-charge no.)

When the input from the OLD SECONDARY MASTER is not in sequence the above messages are set out, indicating the two sequence checking fields.

- (l) USERS PERT TIME TAPE OUT OF SEQUENCE  
CURRENT (network no. -predecessor-successor)  
NEW (network no. -predecessor-successor)

When the information from the USERS TIME TAPE is not in sequence the above messages are set out, indicating the two sequence checking fields.

- (m) NETWORK CODE SET UP TWICE ON SEC MASTER -  
XXXXXX

The same network code is found in two consecutive network code records of the OLD SECONDARY MASTER. The network code is set into the field indicated by XXXXXX.

- (n) TWO EOF MARKS FOUND WITH NO PARAMETER  
INDICATION

There is no "1B" card in the input parameters to indicate that a non-operative file is present.

- (o) FIRST WORD ON INPUT PARAMETERS BLANK

The "1B" portion of the INPAR table indicates that the USERS TIME TAPE read is finished and nothing has yet been read.

- (p) NO FIELDS TIED TO THIS RECORD TYPE X

One of the "1B" file cards describing a particular record type was not found in this file. The "X" will indicate the record type.

- (q) BAD MONTH ON BASE DATE

The month field on the base date is an illegitimate value for a month.

- (r) NO START DATE TO TIME NETWORK

The start date carried in the USERS TIME TAPE has a value of zero.

- (s) START DATE OF NETWORK PRIOR TO 1945

The network start date is prior to the calendar used, which has a January 1, 1945 base.

The following error messages are set out on the on-line printer with an option to continue after stopping.

(t) NO ACTIVITIES TIED TO NETWORK CODE XXXXXX

When two network codes in a row are located on the SECONDARY MASTER the above message is set out with the first network code being set into the field indicated by XXXXXX. This error will not stop the system but will set this message out on-line.

(u) DATE DOES NOT AGREE ON USERS TAPE DDMMYY  
IF LABEL IS TO BE IGNORED HIT START BUTTON  
TO CONTINUE

The report date on the USERS TIME TAPE does not match with the users date on the "A" control card. If the program is to be continued the start button is hit. The DDMMYY configuration in the first line will indicate the day, month and year of the report date in the USERS TIME TAPE.

Time Merge Phase Region Descriptions

The following region descriptions and flow charts will describe the major subroutines used in the time merge phase as well as the time merge phase itself.

### Region PMRG

#### EXPLANATION OF REGION:

This routine will accomplish the tying together of activities and charge numbers. It will read the USERS TIME TAPE, OLD SECONDARY MASTER and SORTED DATA TAPE to perform this merging process and will produce a NEW SECONDARY MASTER. This routine will also develop the input parameter table, "INPAR."

#### CALLING SEQUENCE:

L     TRA   PMRG

#### INPUT:

Type 1 and type 2 input data from the SORTED DATA TAPE.

An input parameter table or the development of one.

An OLD SECONDARY MASTER TAPE.

A USERS TIME TAPE

#### OUTPUT:

A new input parameter table to go on NEW SECONDARY MASTER

A NEW SECONDARY MASTER

A selected set of time input linked to charge numbers to be sorted in charge number sequence for the update phase.

#### STORAGE USED:

|       |   |                                    |
|-------|---|------------------------------------|
| INPAR | - | input parameter table              |
| WKCH1 | - | network code on changes            |
| WKCH2 | - | event no. on changes               |
| WKSM1 | - | network code on SEC MASTER         |
| WKSM2 | - | event no. on SEC MASTER            |
| NNHLD | - | network name                       |
| WKBFF | - | input to be set on SEC MASTER      |
| PTWKA | - | selected time info from USERS TAPE |
| PTWK7 | - | start date & number                |
| PTWK8 | - | USERS TAPE network name            |
| PTWK9 | - | USERS TAPE network-pred-succ       |
| PUBFF | > | users read-in buffer               |
| PUBF1 | < |                                    |

Region PMRG (continued)

SUBREGIONS AND SUBROUTINES USED:

|      |      |      |       |      |      |
|------|------|------|-------|------|------|
| PMSU | PX20 | PX60 | PX85  | PD60 | PD70 |
| PX01 | PX25 | PX65 | ENDPM | PD65 | PD75 |
| PX05 | PX30 | PX70 | PMRD  | PD66 | PD80 |
| PX10 | PX40 | PX75 | PD50  | PD67 |      |
| PX15 | PX50 | PX80 | PD55  | PD68 |      |

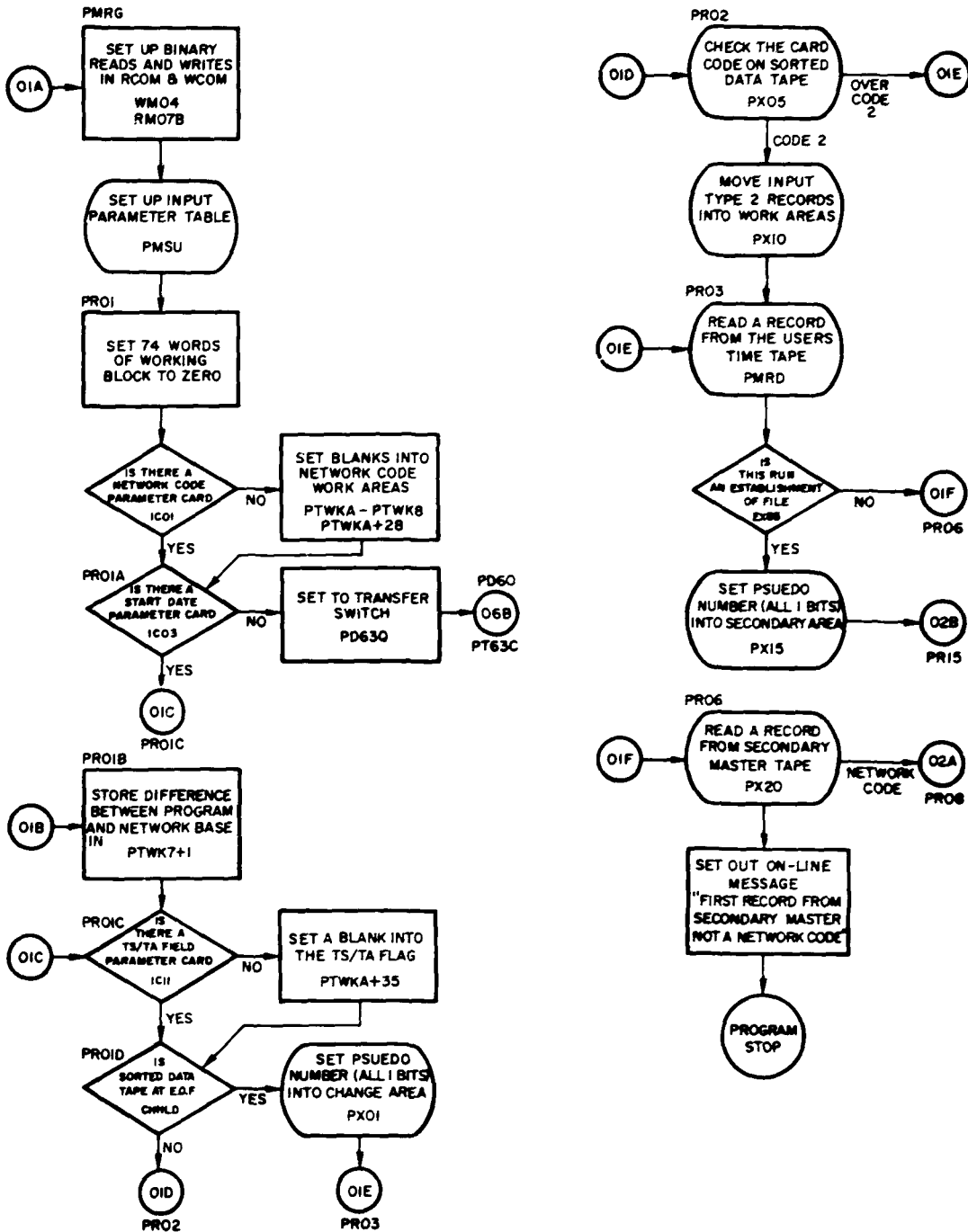
EXPLANATION OF CALLING SEQUENCE:

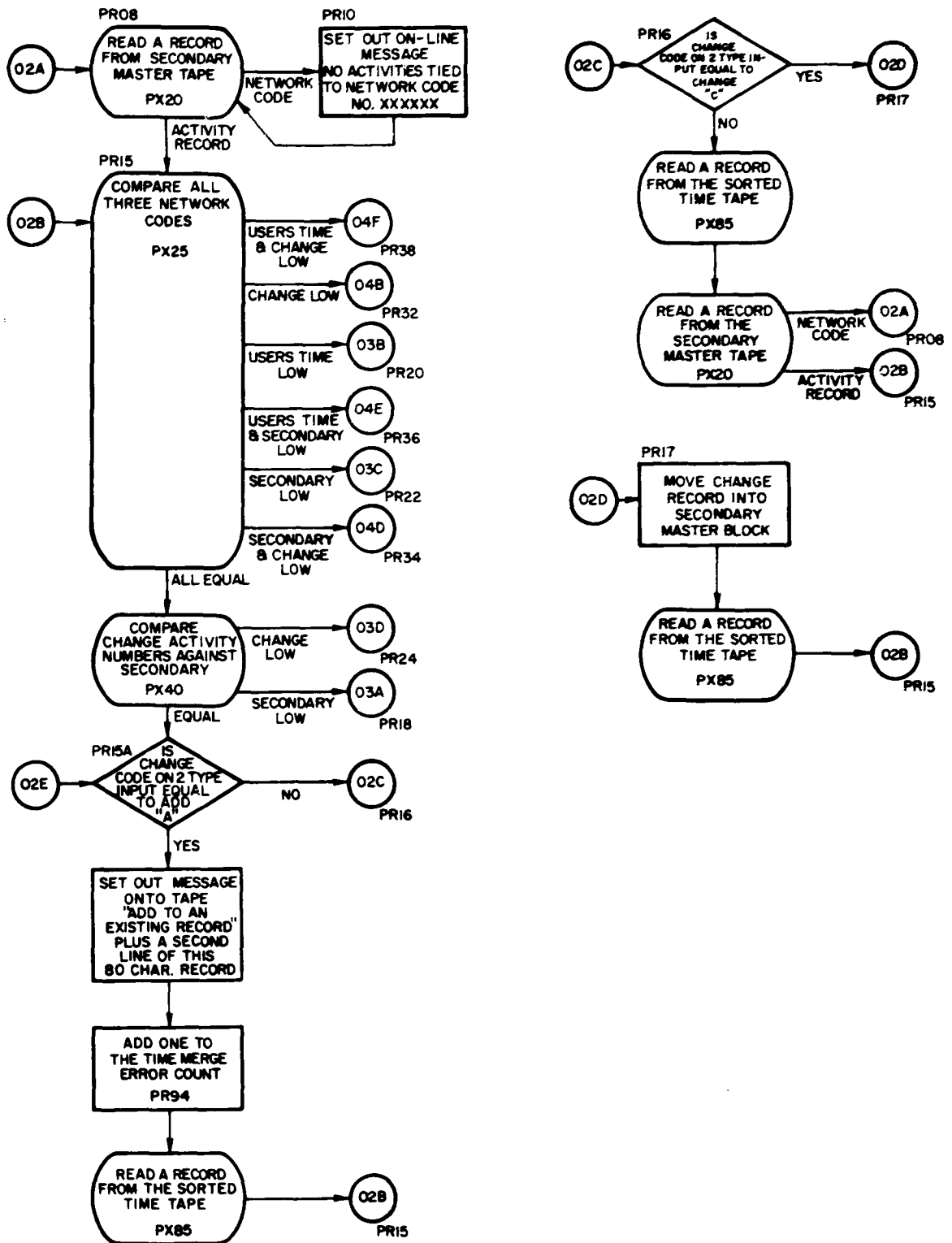
When the time merge phase is finished the outlink is a transfer to PUAOT, which will take the system into the update phase.

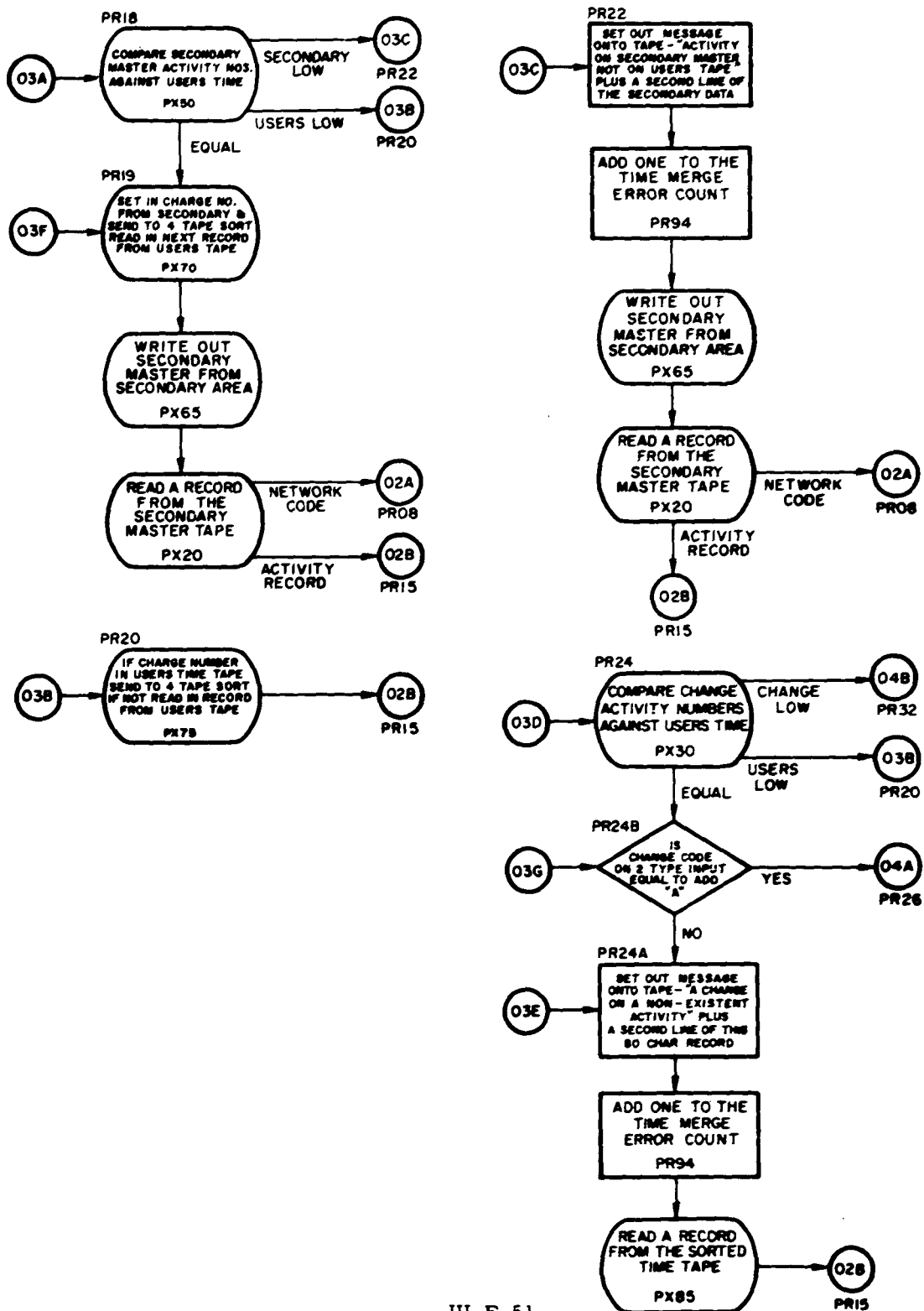


# REGION PMRG

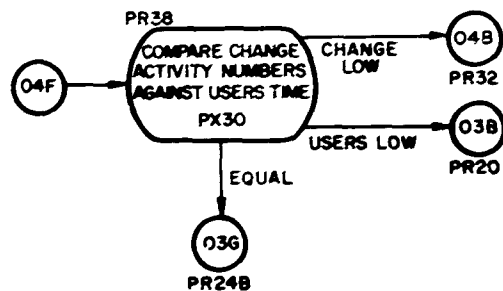
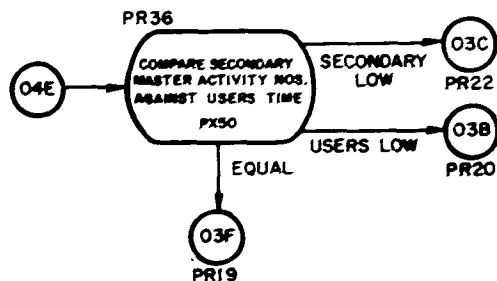
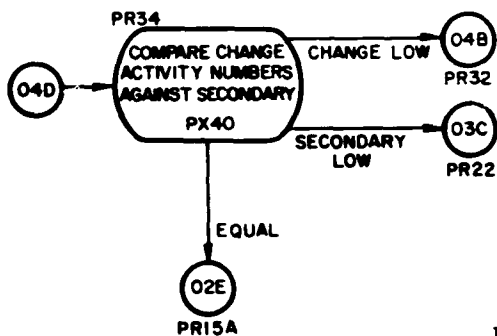
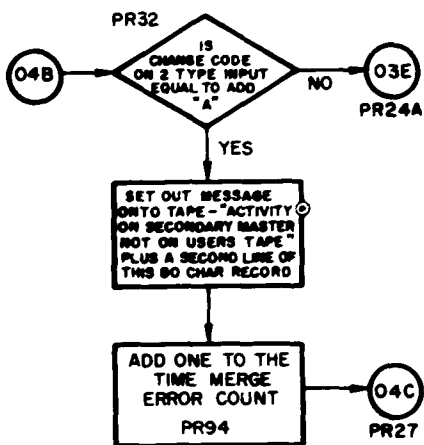
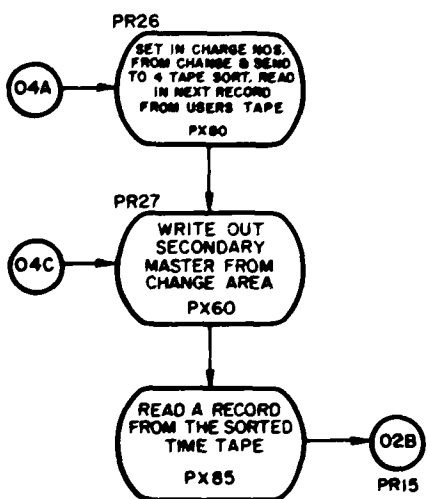
## PERT TIME MERGE ROUTINE







# REGION PMRG



Region PX01

EXPLANATION OF REGION:

To set a pseudo number of all 1-bits into the change record blocks WKCH1 and WKCH2

CALLING SEQUENCE:

L       TSX   PX01, 4  
L + 1   Normal return

INPUT:

Not applicable.

OUTPUT:

E. O. F. on change tape indicator PR99. It is set to a value other than zero and WKCH1 and WKCH2 contain all 1-bits.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

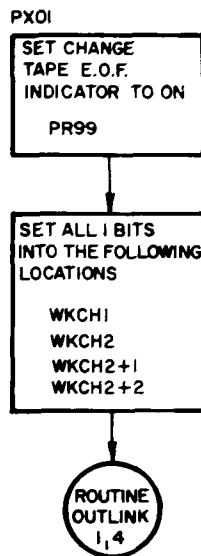
Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION PXOI

SET PSEUDO NUMBER INTO CHANGE AREA



Region PX05

**EXPLANATION OF REGION:**

To test the input code on the data contained in the SORTED DATA TAPE for a type 2 code.

**CALLING SEQUENCE:**

L       TSX   PX05, 4  
L + 1   Normal return if code over 2  
L + 2   Normal return if code equal to 2

**INPUT:**

The input data code.

**OUTPUT:**

Not applicable.

**STORAGE USED:**

Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

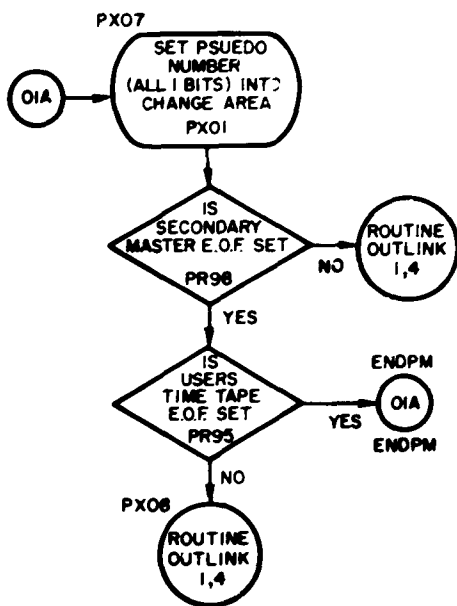
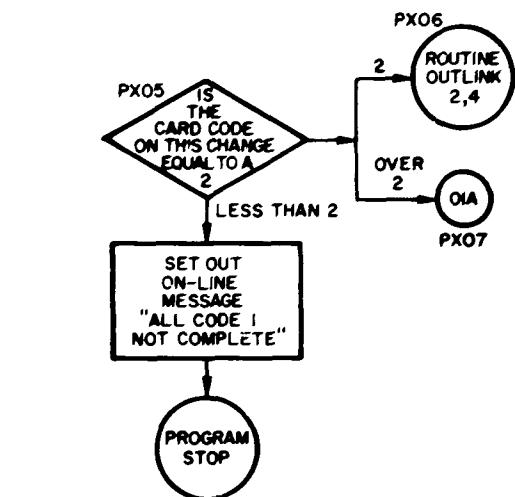
Not applicable.

**EXPLANATION OF CALLING SEQUENCE:**

If the code is a 1 an exception message is set out on the on-line printer and the system is stopped.

# REGION PX05

CHECK CARD CODE ON  
SORTED DATA TAPE





Region PX10

**EXPLANATION OF REGION:**

This routine will move the input data record into its check area WKCH1 and WKCH2

**CALLING SEQUENCE:**

L      TSX    PX10, 4

L + 1   Normal return

**INPUT:**

Network code, predecessor, and successor from input data card.

**OUTPUT:**

The above input set into WKCH1 and WKCH2.

**STORAGE USED:**

Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

Not applicable.

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.

REGION PX10

---

MOVE CHANGE RECORD  
INTO WORK AREA

PX10

MOVE THE  
CHANGE RECORD  
INTO THE  
FOLLOWING  
LOCATIONS

WKCH 1  
WKCH 2  
WKCH 2+1  
WKCH 2+2

ROUTINE  
OUTLINK  
1,4

Region PX15

EXPLANATION OF REGION:

To set a pseudo number of all 1-bits into the secondary master blocks WKSM1 and WKSM2

CALLING SEQUENCE:

L      TSX    PX15, 4

L + 1   Normal return

INPUT:

Not applicable.

OUTPUT:

E. O. F. on SECONDARY MASTER indicator PR98. It is set to a value other than zero and WKSM1 and WKSM2 contain all 1-bits.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

Not applicable.

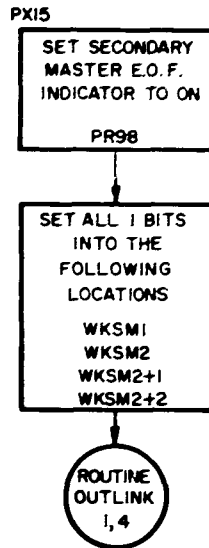
EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION PX15

---

SET PSEUDO NUMBERS  
INTO SECONDARY  
MASTER AREA



Region PX20

EXPLANATION OF REGION:

This routine will read the OLD SECONDARY MASTER, check sequence, and set the information into WKSM1 or WKSM2, according to the type of record.

CALLING SEQUENCE:

L       TSX   PX20, 4  
L + 1   Normal return for network record  
L + 2   Normal return for data record

INPUT:

OLD SECONDARY MASTER TAPE

OUTPUT:

The SECONDARY MASTER DATA set into WKSM1 and WKSM2.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

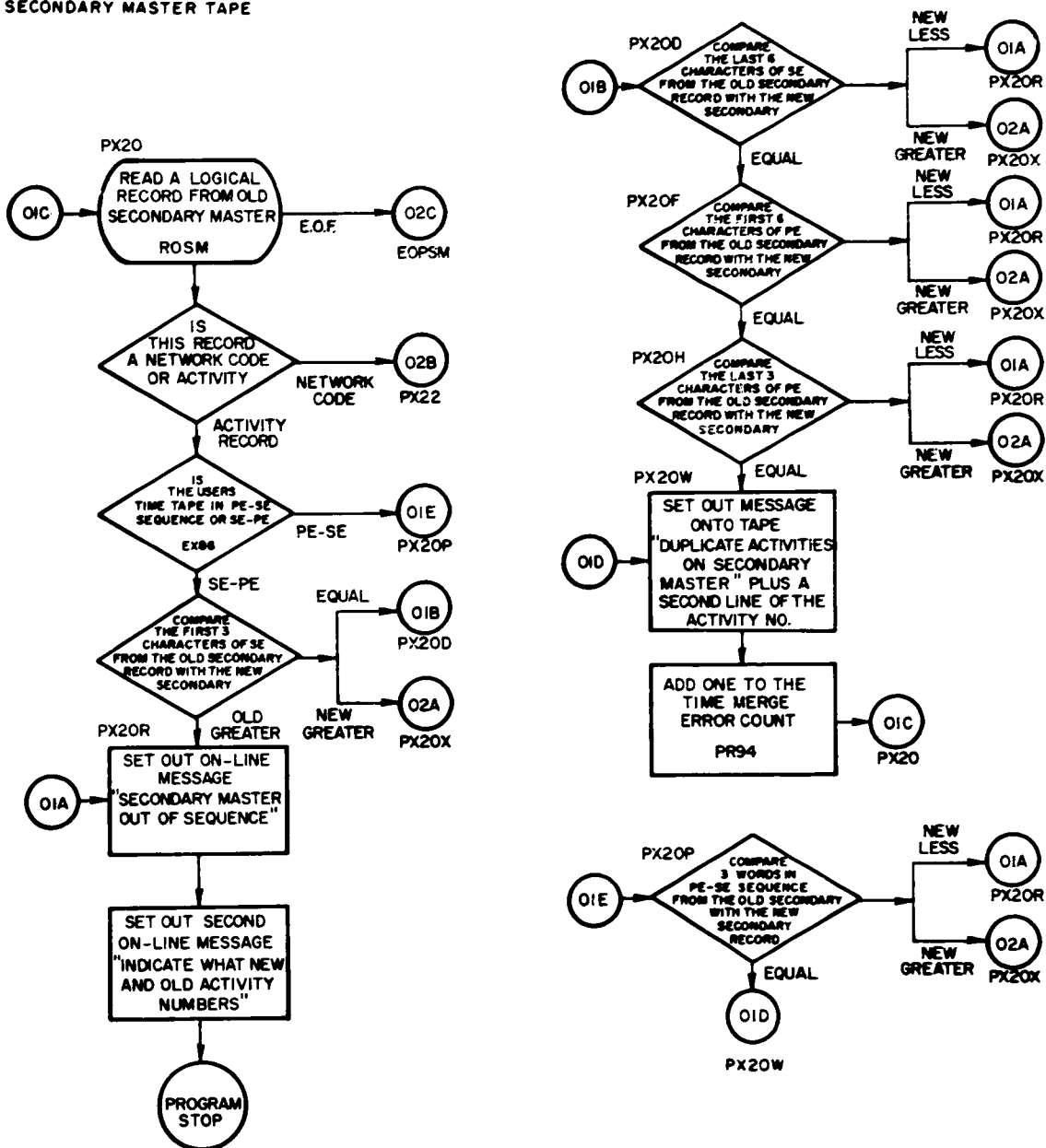
ROSM

EXPLANATION OF CALLING SEQUENCE:

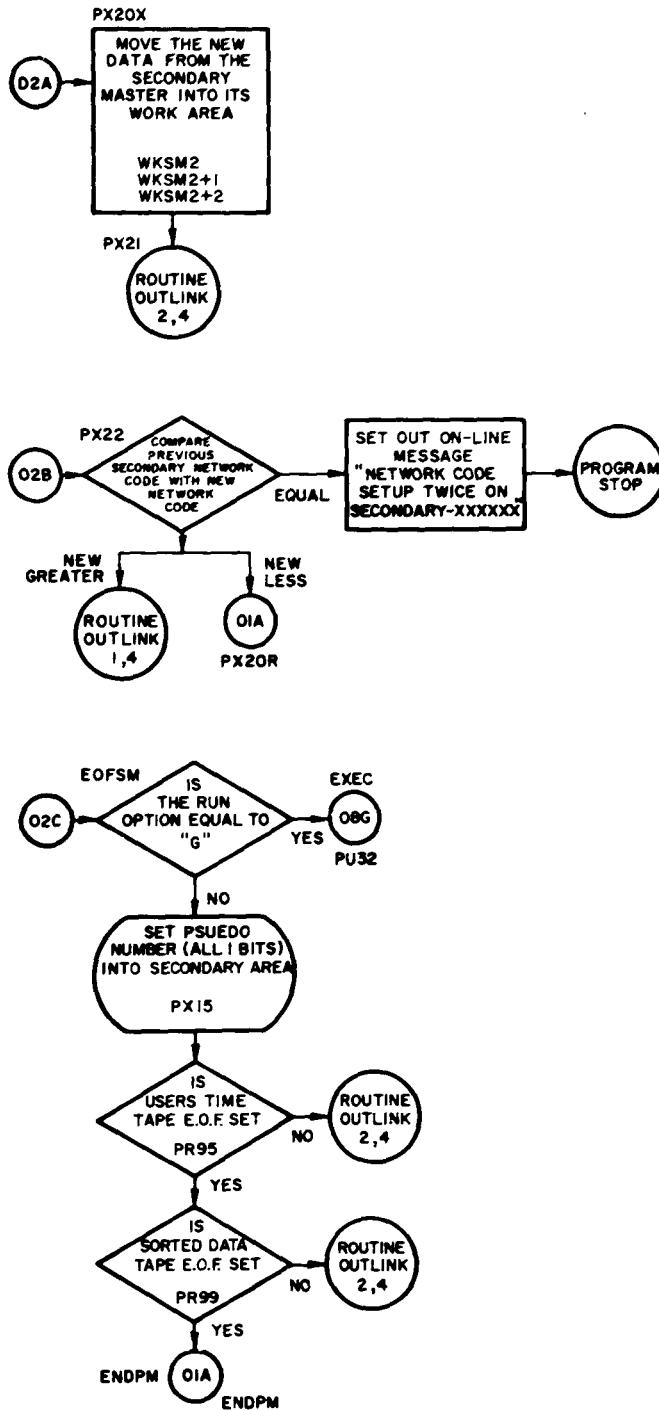
If an error occurs the reason for the error is printed out on-line and the system will stop.

# REGION PX20

READ A RECORD FROM  
SECONDARY MASTER TAPE



REGION PX20



Region PX25

**EXPLANATION OF REGION:**

This routine will compare all three files into the time merge (USERS TIME TAPE, SORTED DATA TAPE, and OLD SECONDARY MASTER) for the lowest network code value.

**CALLING SEQUENCE:**

L      TSX    PX25, 4  
L + 1   Userstime and input low return  
L + 2   Onlyinput low return  
L + 3   Only users time low return  
L + 4   Users time and SECONDARY MASTER low return  
L + 5   Only SECONDARY MASTER low return  
L + 6   SECONDARY MASTER and input low return  
L + 7   All three are equal return

**INPUT:**

The network codes for all three files.

**OUTPUT:**

Not applicable.

**STORAGE USED:**

Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

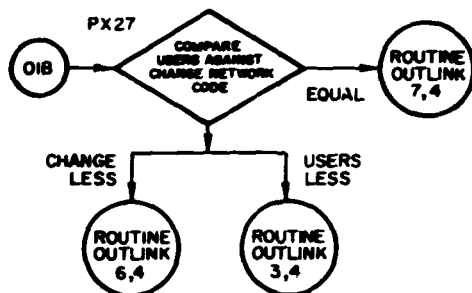
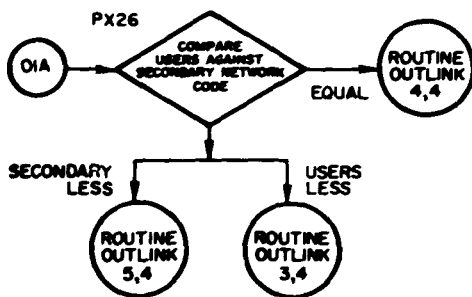
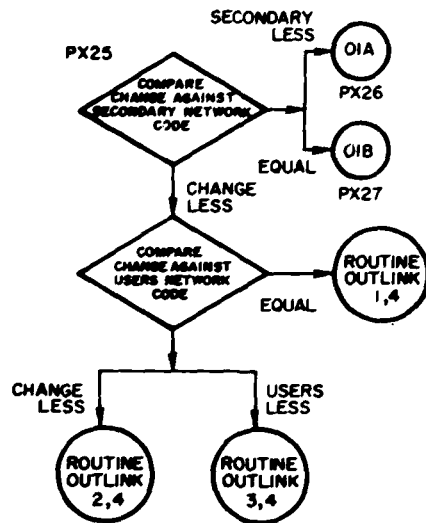
Not applicable.

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.



NETWORK NUMBER  
COMPARE ROUTINE



Region PX30

**EXPLANATION OF REGION:**

Check the USERS TIME TAPE activities against the SORTED DATA TAPE activities for the lower of the two.

**CALLING SEQUENCE:**

L       TSX   PX30, 4  
L + 1   Data input lower return  
L + 2   Users information lower return  
L + 3   Both of the above equal return

**INPUT:**

The data in WKCH2 and PTWKA for comparisons.

**OUTPUT:**

Not applicable.

**STORAGE USED:**

No applicable.

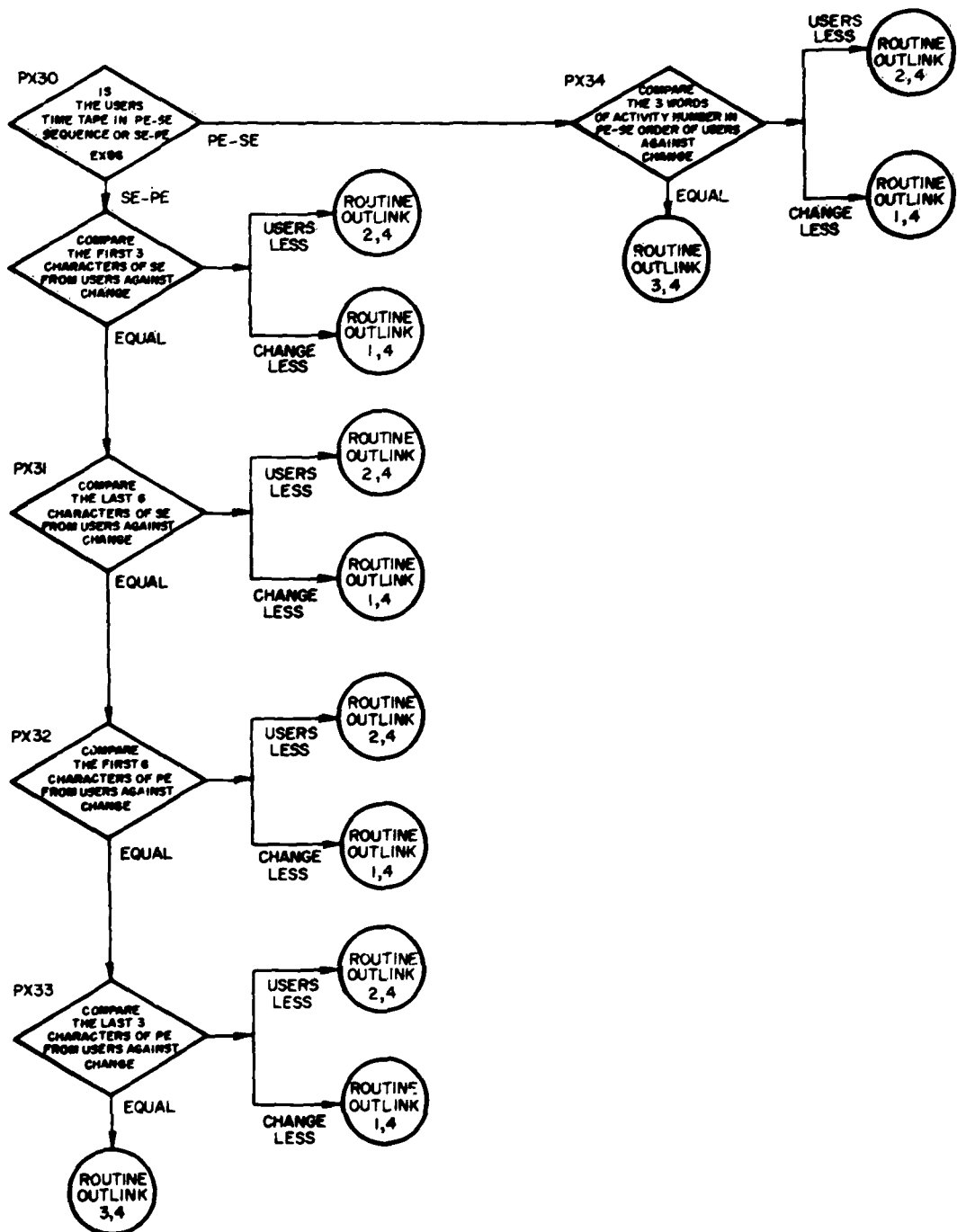
**SUBREGIONS AND SUBROUTINES USED:**

Not applicable.

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.

CHECK USERS ACTIVITY  
NUMBERS AGAINST CHANGES



Region PX40

EXPLANATION OF REGION:

Check the SORTED DATA TAPE activities against the OLD SECONDARY MASTER TAPE activities for the lower of the two.

CALLING SEQUENCE:

L       TSX   PX40, 4  
L + 1   Data input lower return  
L + 2   Secondary master input lower return  
L + 3   Both of the above equal return

INPUT:

The data in WKCH2 and WKSM2 for comparisons.

OUTPUT:

Not applicable.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

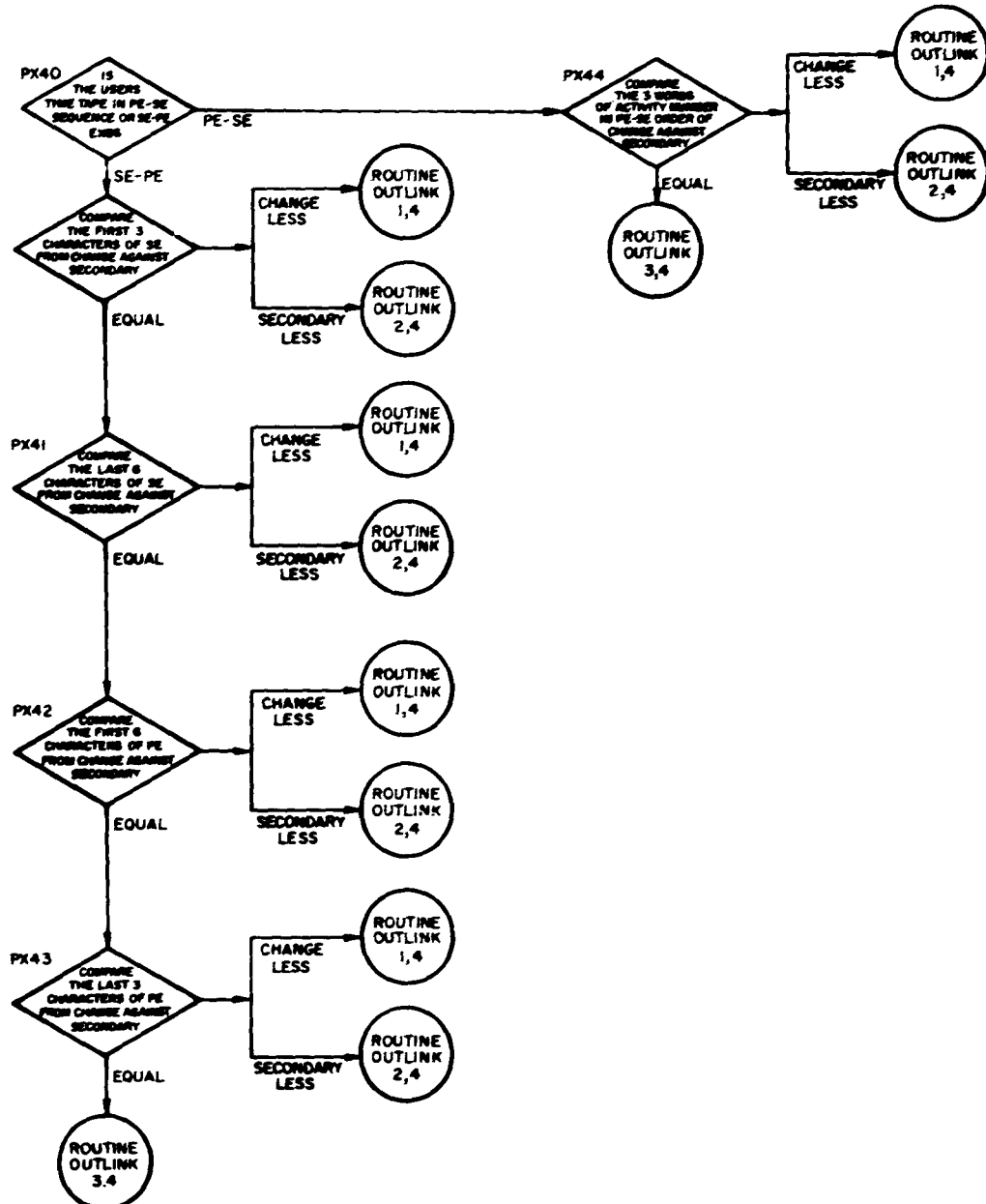
Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION PX40

CHECK CHANGE ACTIVITY NUMBERS  
AGAINST SECONDARY MASTER



Region PX50

**EXPLANATION OF REGION:**

Check the OLD SECONDARY MASTER TAPE activities against the  
USERS TIME TAPE activities for the lower of the two.

**CALLING SEQUENCE:**

L       TSX   PX50, 4  
L + 1   Secondary master lower return  
L + 2   Users tape lower return  
L + 3   Both of the above equal return

**INPUT:**

The data in WKSM2 and PTWKA for comparisons.

**OUTPUT:**

Not applicable.

**STORAGE USED:**

Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

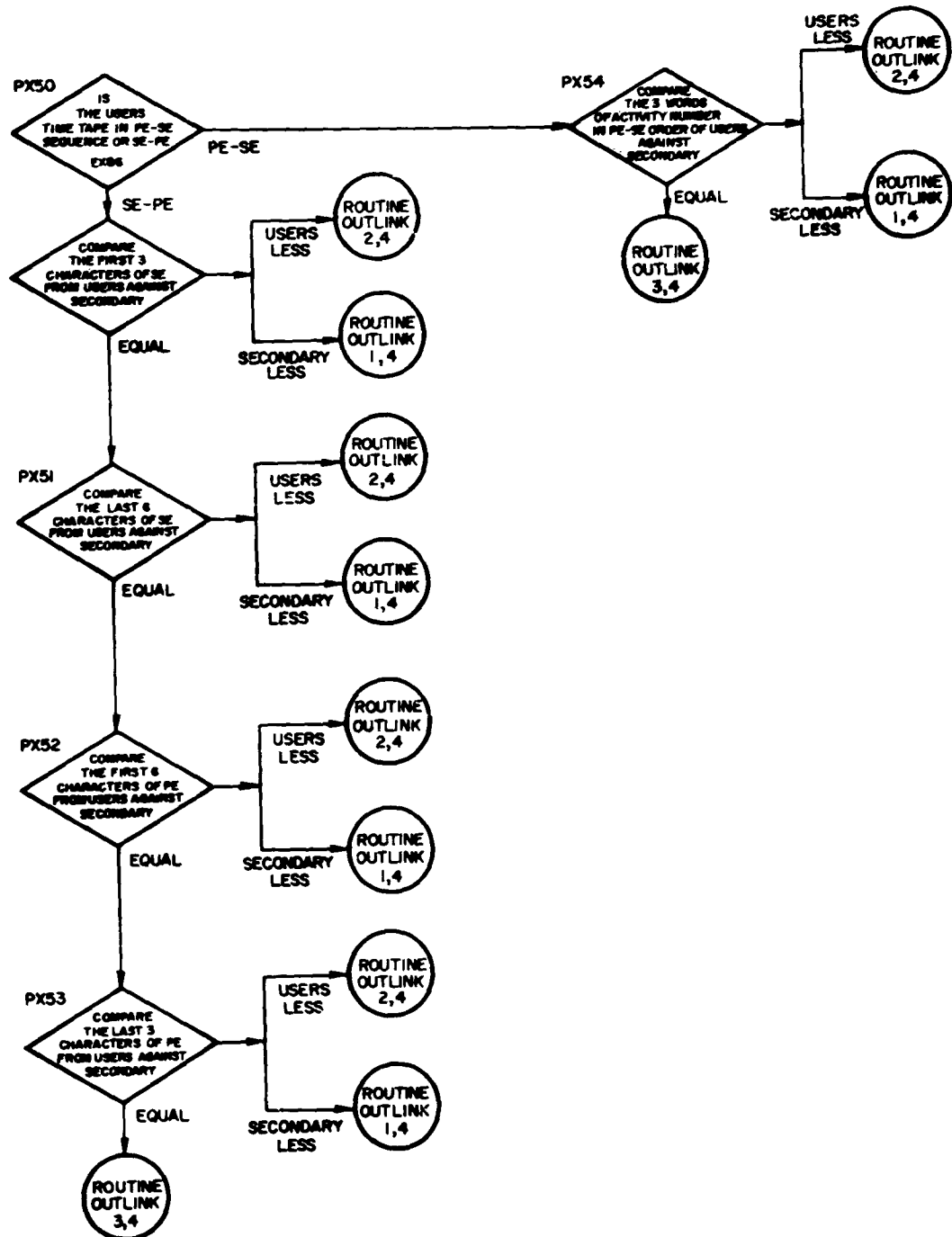
Not applicable.

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.

# REGION PX60

CHECK USERS ACTIVITY NUMBERS  
AGAINST SECONDARY MASTER



Region PX60

**EXPLANATION OF REGION:**

This routine will write the NEW SECONDARY MASTER from data that has been set up from the SORTED DATA TAPE.

**CALLING SEQUENCE:**

L       TSX   PX60, 4

L + 1   Normal return

**INPUT:**

SORTED DATA TAPE information in core.

**OUTPUT:**

A network code and data record or just a data record (depending on PR97) onto the NEW SECONDARY MASTER TAPE.

**STORAGE USED:**

PR97 - flag to indicate whether a network code has been already set onto the SECONDARY MASTER.

**SUBREGIONS AND SUBROUTINES USED:**

Not applicable.

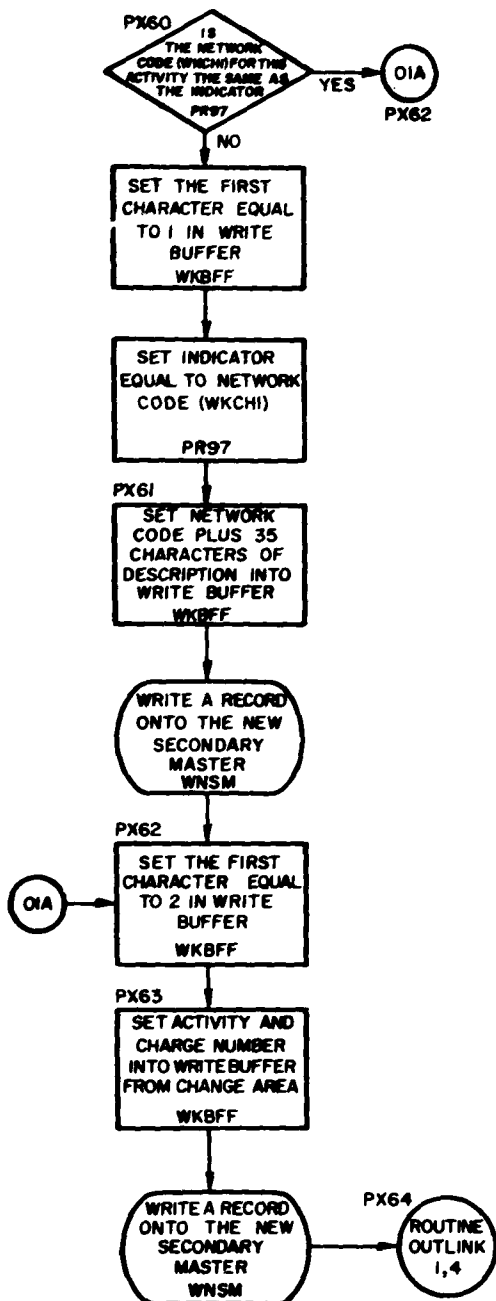
**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.



REGION PX60

WRITE OUT SECONDARY MASTER  
FROM NEW ADDS



Region PX65

**EXPLANATION OF REGION:**

This routine will write the NEW SECONDARY MASTER from data that has been set up from the OLD SECONDARY MASTER.

**CALLING SEQUENCE:**

L       TSX   PX65, 4

L + 1   Normal return

**INPUT:**

OLD SECONDARY MASTER information in core.

**OUTPUT:**

A network code and data record or just a data record onto the NEW SECONDARY MASTER TAPE, depending on PR97.

**STORAGE USED:**

PR97 - flag to indicate whether a network code has been already set onto the SECONDARY MASTER.

**SUBREGIONS AND SUBROUTINES USED:**

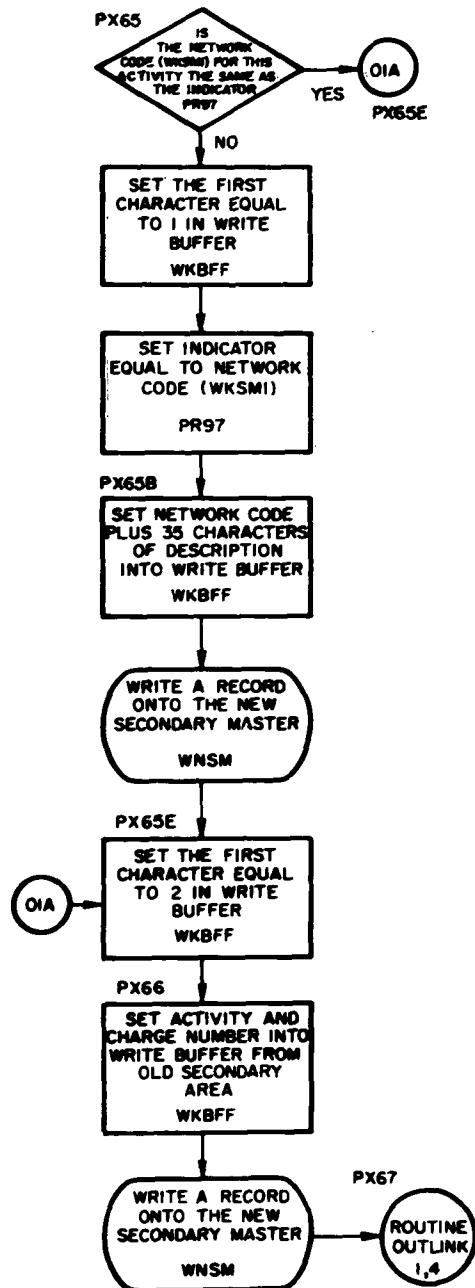
Not applicable.

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.

REGION PX65

WRITE OUT SECONDARY MASTER  
FROM OLD SECONDARY AREA



Region PX70

EXPLANATION OF REGION:

This routine will set the charge number from the OLD SECONDARY MASTER into the selected time information and send the data into the sort routine. It will also read another record from the USERS TIME TAPE.

CALLING SEQUENCE:

L       TSX   PX70, 4  
L + 1   Normal return

INPUT:

The charge number from the OLD SECONDARY MASTER.

OUTPUT:

A record on the sort tapes to be sorted in charge number sequence.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

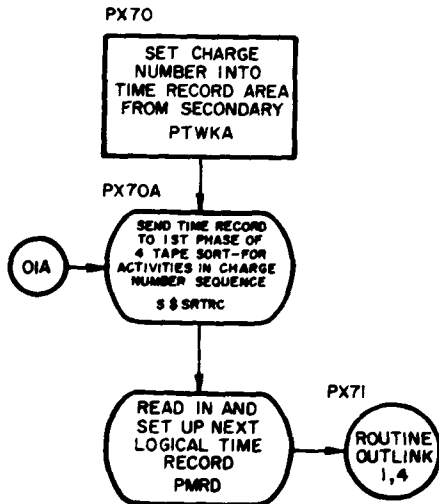
\$\$SRTRC                               PMRD

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION PX70

SET CHARGE NUMBER FROM  
SECONDARY INTO TIME  
RECORD AND SORT



## Region PX75

**EXPLANATION OF REGION:**

This routine will check for the charge number in the USERS TIME TAPE to set the selected time information record out onto the sort tapes. If the USERS TIME TAPE does not contain the charge number no information is set out and the next users record is read.

**CALLING SEQUENCE:**

L TSX PX75; 4

L + 1 Normal return

**INPUT:**

Selected time information record from USERS TIME TAPE at location PTWKA.

**OUTPUT:**

A record on the sort tapes to be sorted in charge number sequence if the record contains a charge number.

**STORAGE USED:**

Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

**S\$SRTRC**

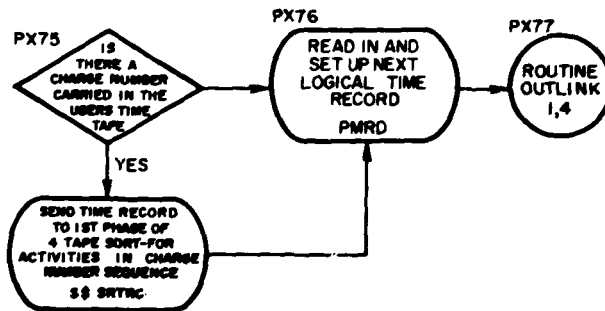
PMRD

**EXPLANATION OF CALLING SEQUENCE:**

**Not applicable.**

REGION PX75

CHECK FOR USERS CHARGE  
NUMBER IN TIME RECORD  
AND SORT



Region PX80

**EXPLANATION OF REGION:**

This routine will set the charge number from the SORTED DATA TAPE into the selected time information and send the data into the sort routine. It will also read another record from the USERS TIME TAPE.

**CALLING SEQUENCE:**

L       TSX   PX80, 4  
L + 1   Normal return

**INPUT:**

The charge number from new data off of the SORTED DATA TAPE.

**OUTPUT:**

A record on the sort tapes to be sorted in charge number sequence.

**STORAGE USED:**

Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

S\$SRTRC                               PMRD

**EXPLANATION OF CALLING SEQUENCE:**

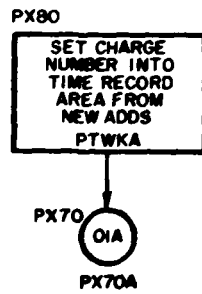
Not applicable.



REGION PX80

---

SET CHARGE NUMBER FROM  
NEW ADDS INTO TIME RECORD  
AND SORT



Region PX85

**EXPLANATION OF REGION:**

This routine will read the SORTED DATA TAPE, check sequence, and set the information into WKCH1 and WKCH2.

**CALLING SEQUENCE:**

L      TSX    PX85, 4

L + 1   Normal return

**INPUT:**

SORTED DATA TAPE

**OUTPUT:**

The type 2 input data set into WKCH1 and/or WKCH2.

**STORAGE USED:**

Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

RCHG

PX10

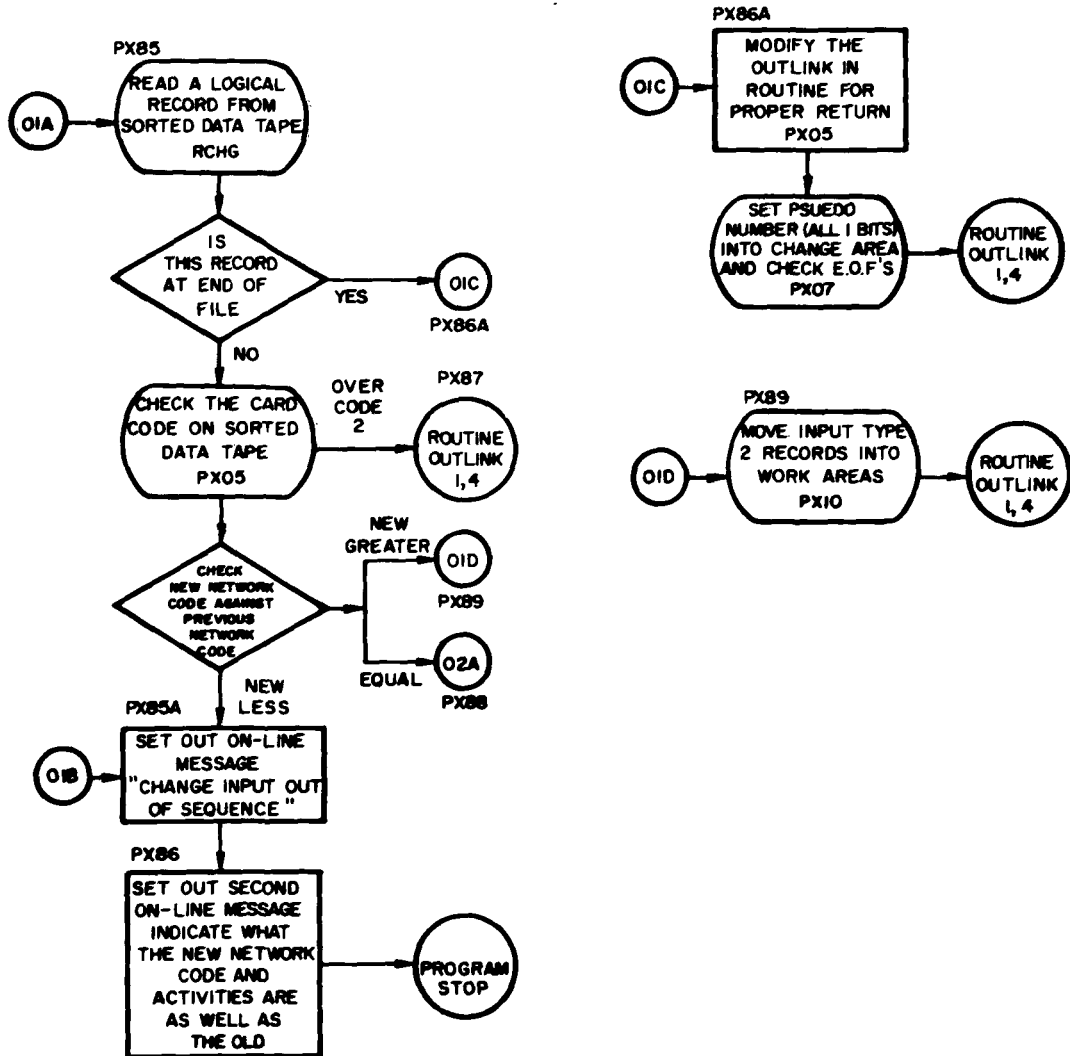
PX05

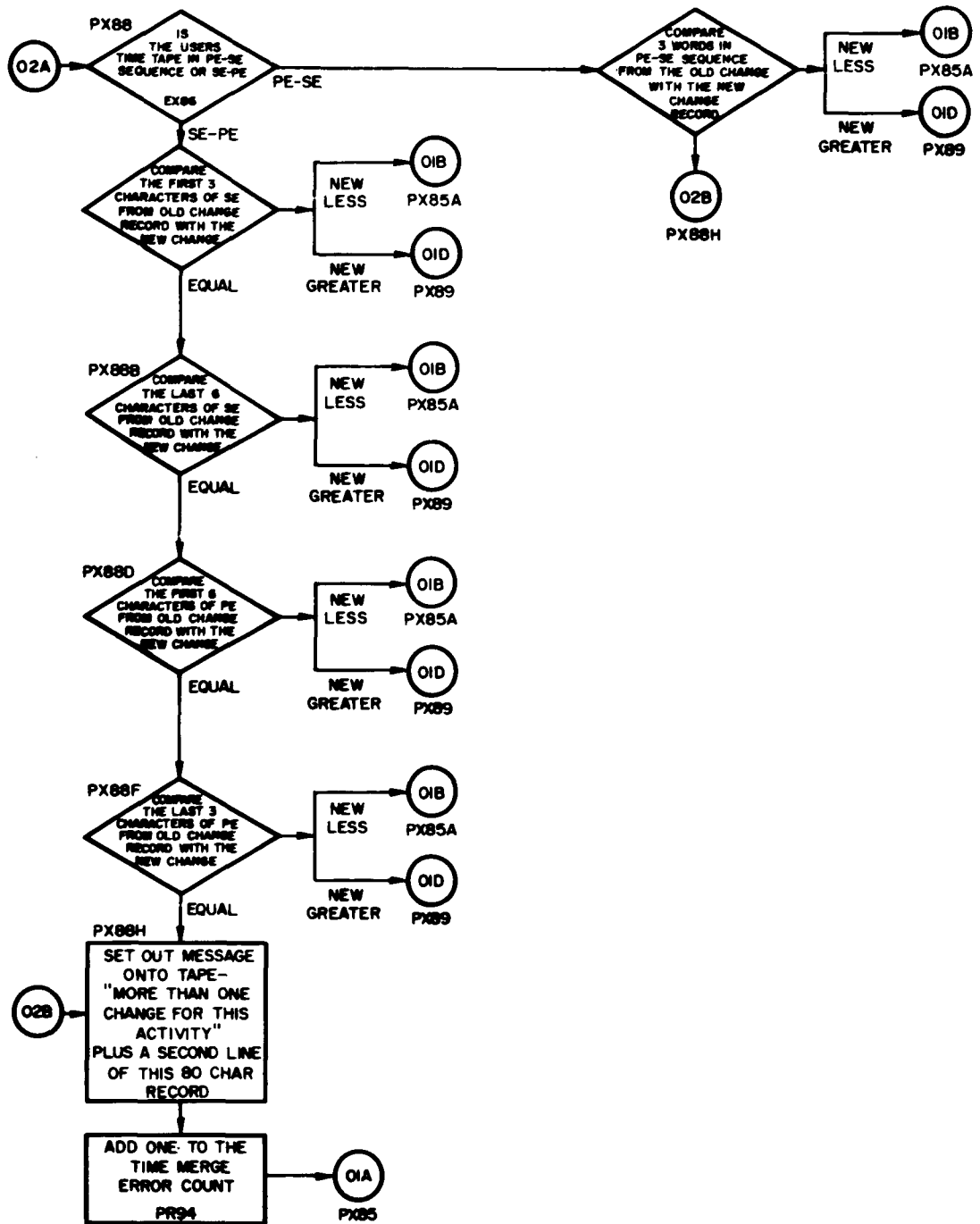
**EXPLANATION OF CALLING SEQUENCE:**

If an error occurs, the reason for the error is printed out on-line and the system will stop.

REGION PX85

READ A RECORD FROM  
SORTED DATA TAPE





Region ENDPM

EXPLANATION OF REGION:

This routine will set out the ending messages for the time merge phase and contain the link into the PERT Cost update phase.

CALLING SEQUENCE:

L    TRA    ENDPM

INPUT:

Number of errors indicated in location PR94.

OUTPUT:

The on-line messages ending the PERT merge phase as shown on Page III-F-2.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

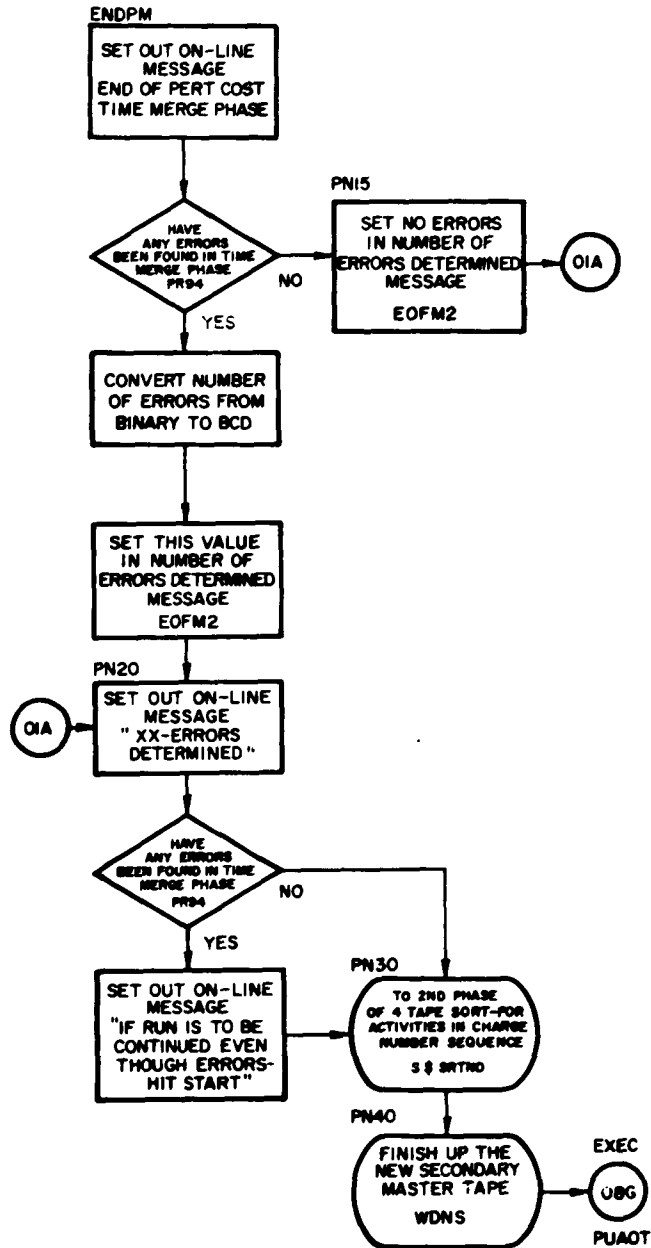
Not applicable.

EXPLANATION OF CALLING SEQUENCE:

When the time merge phase is in this routine it is finished and the outlink is a transfer to PUAOT, which will take the system into the update phase.

# REGION ENDPM

FINISH UP PERT TIME  
MERGE PHASE



### Region PMRD

#### EXPLANATION OF REGION:

This routine will read the USERS TIME TAPE from the input parameter table and set up one record in the PTWKA block. If a sort is necessary to get the information in PE-SE order this routine will accomplish it. The sequence of the USERS TIME TAPE is also verified in this area.

#### CALLING SEQUENCE:

L       TSX   PMRD, 4  
L + 1   Normal return

#### INPUT:

INPAR parameter table  
USERS TIME TAPE

#### OUTPUT:

A selected time information record in the PTWKA block.

#### STORAGE USED:

Not applicable.

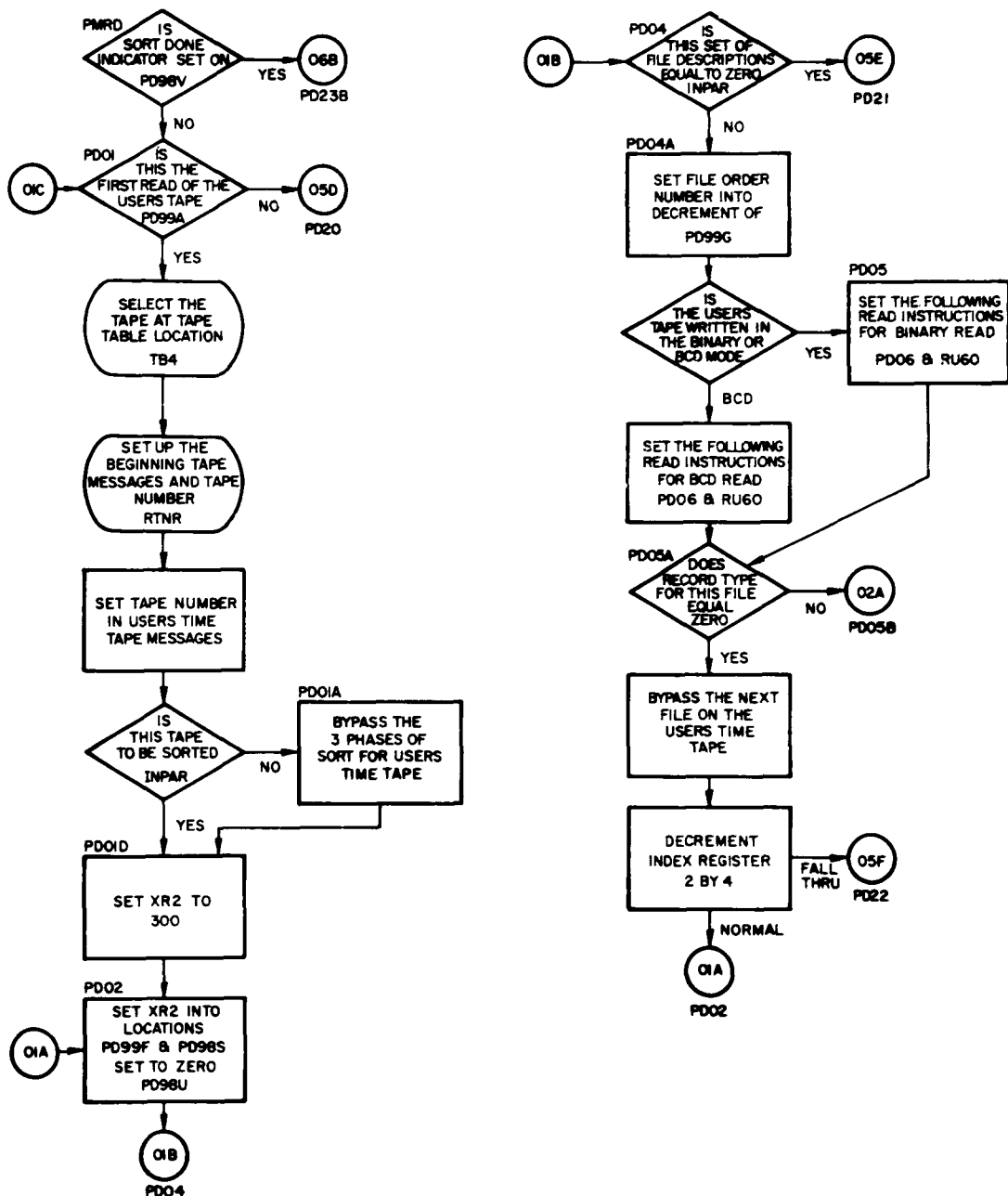
#### SUBREGIONS AND SUBROUTINES USED:

|      |      |      |      |
|------|------|------|------|
| PD50 | PD65 | PD68 | PD80 |
| PD55 | PD66 | PD70 |      |
| PD60 | PD67 | PD75 |      |

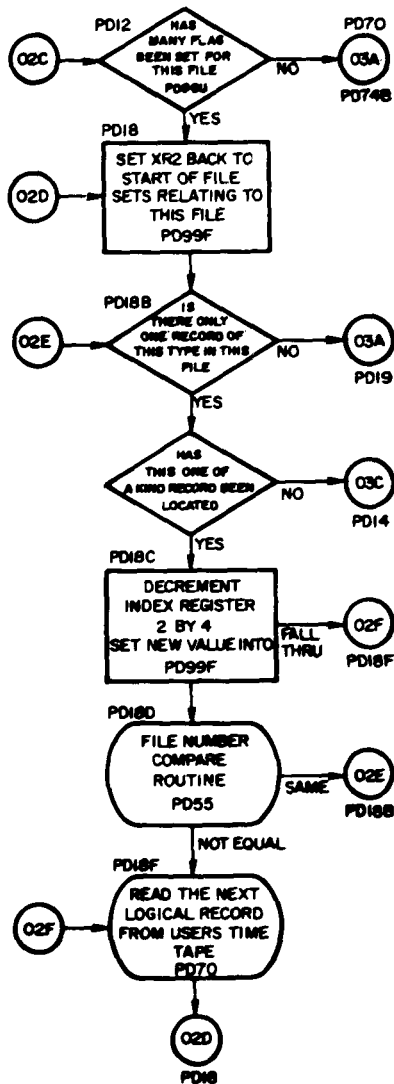
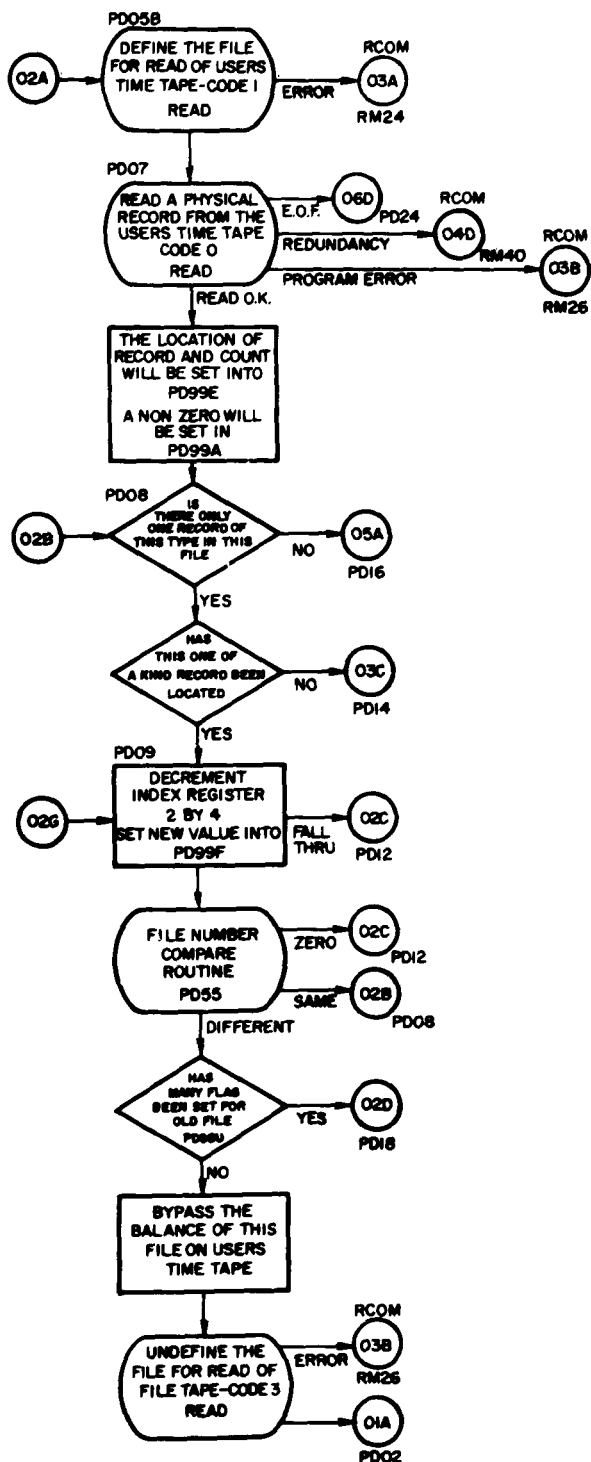
#### EXPLANATION OF CALLING SEQUENCE:

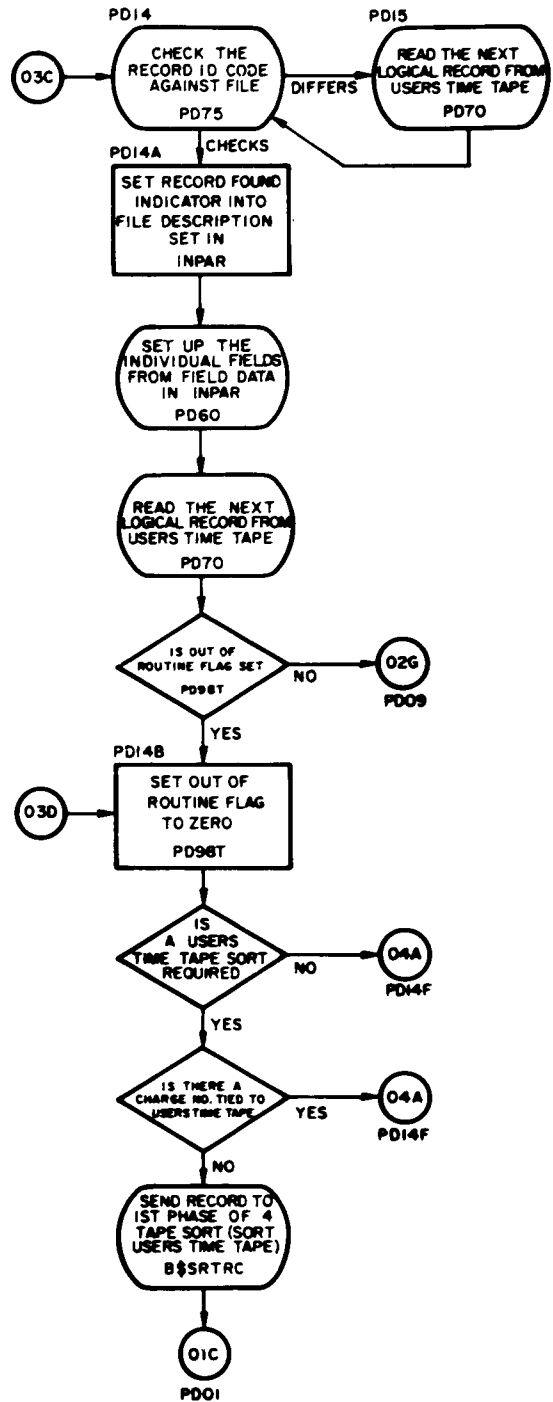
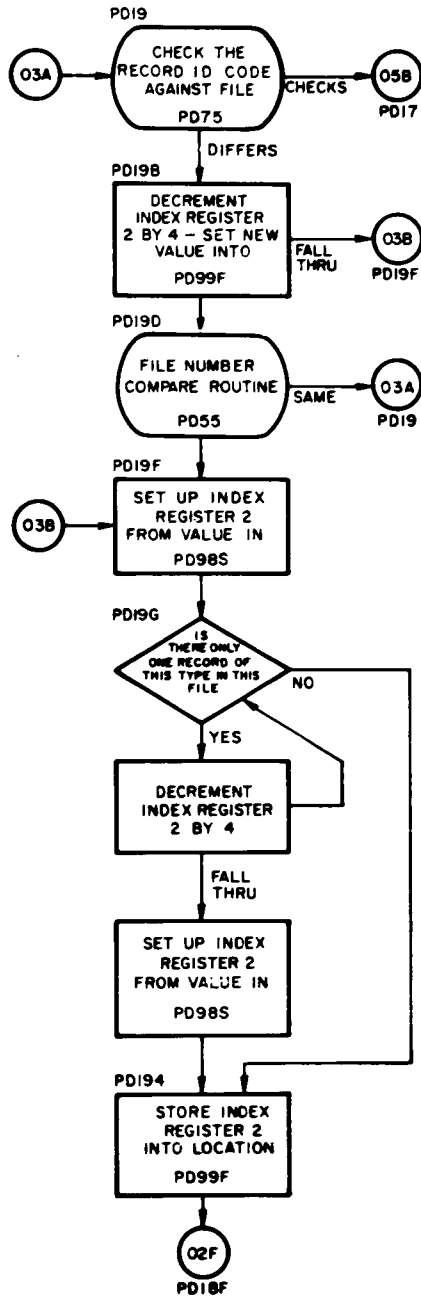
If an error occurs the reason for the error is set out either on the on-line printer or the SYSTEM ERROR TAPE. The system may then stop if the problem warrants it.

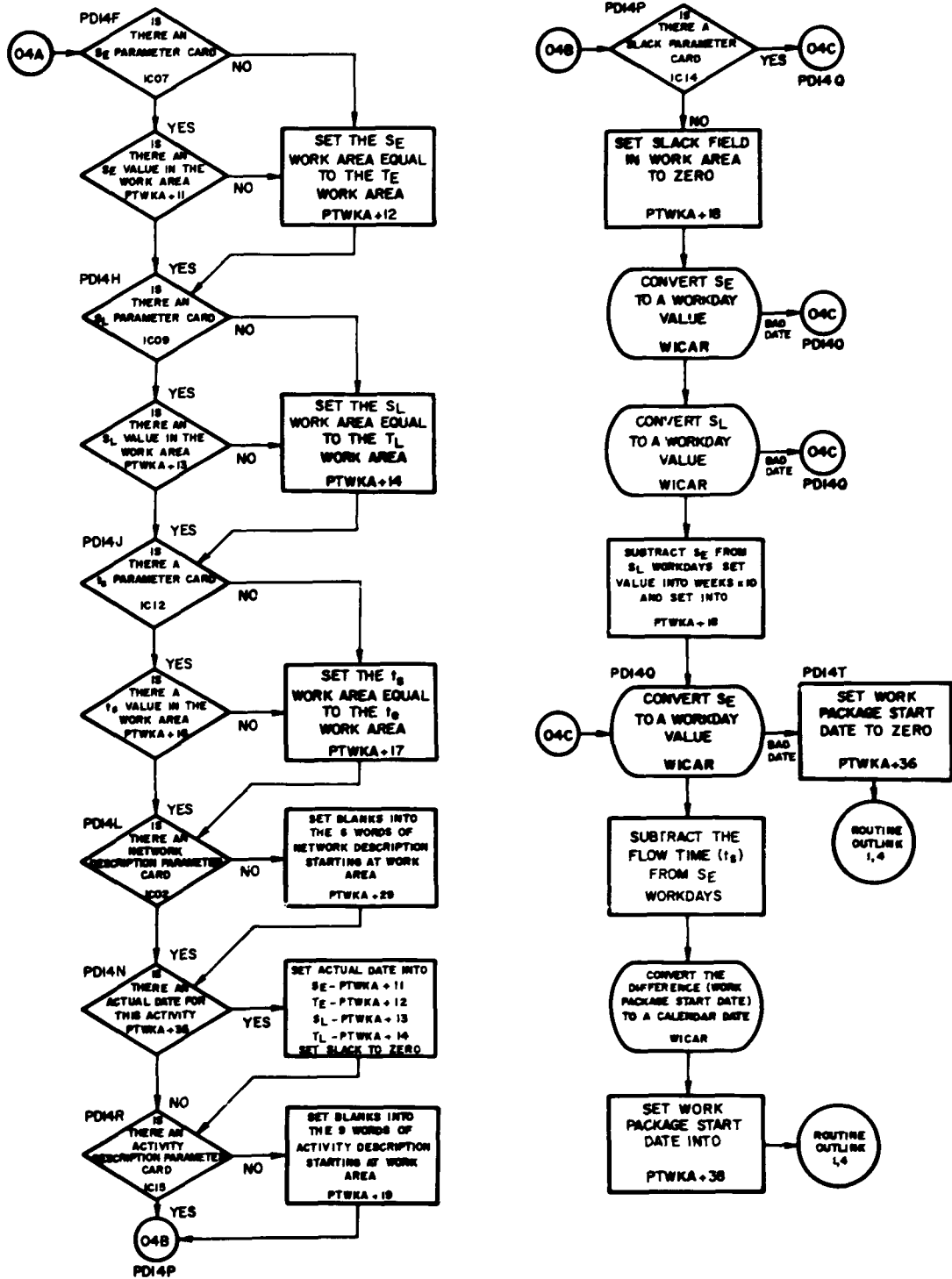
REGION PMRD

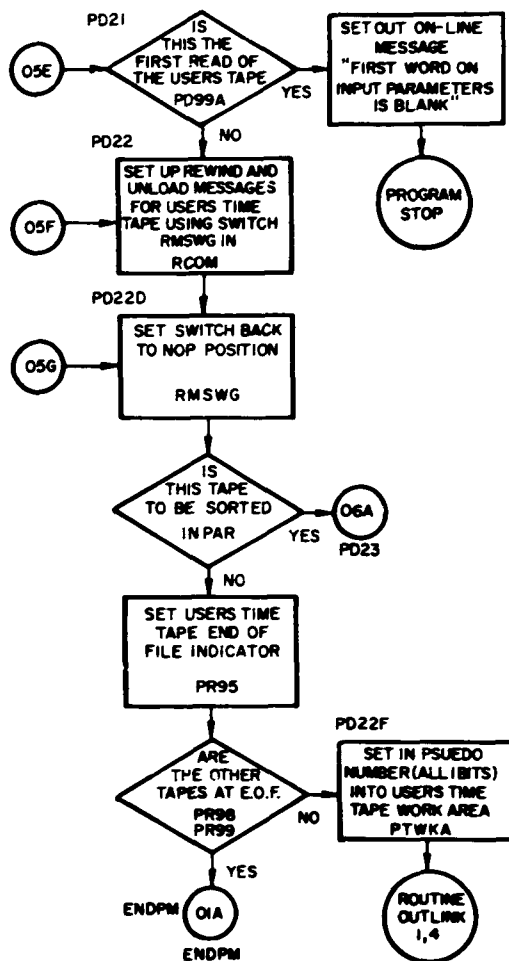
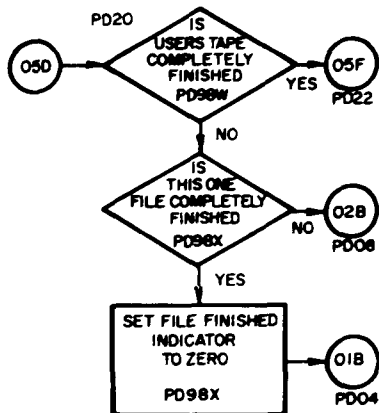
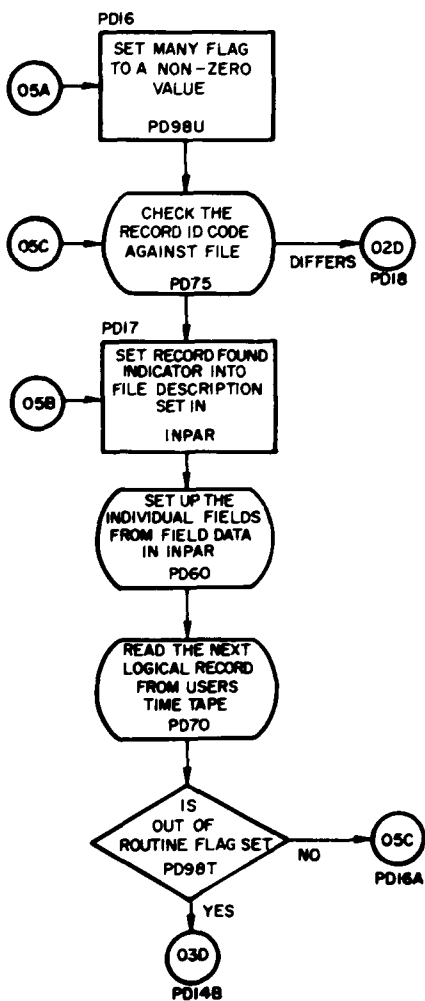




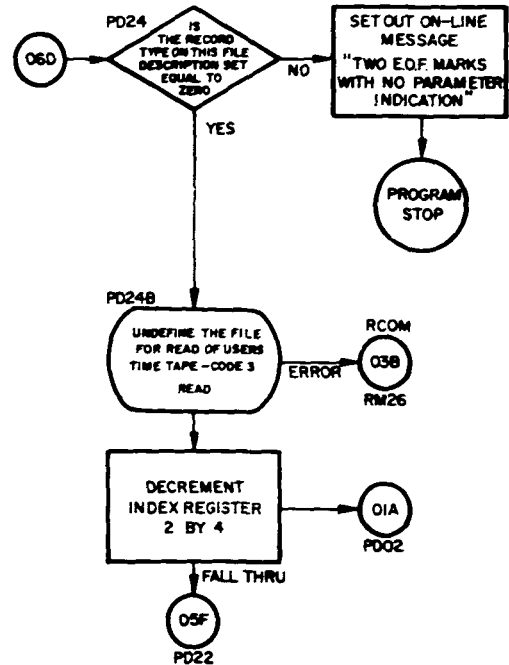
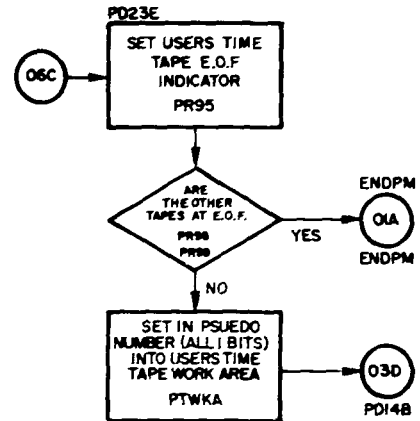
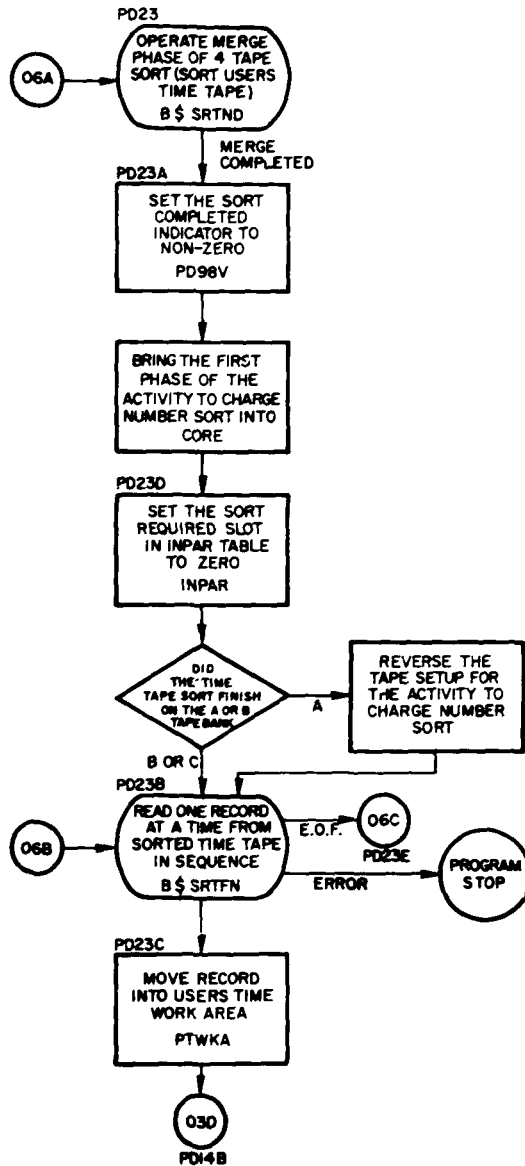








REGION PMRD



Region PD50

EXPLANATION OF REGION:

This region will convert a binary predecessor or successor number to a BCD configuration.

CALLING SEQUENCE:

L    TRA   PD50

INPUT:

The binary value in the location PD69G.

OUTPUT:

The BCD configuration of the binary value in PTWKA.

STORAGE USED:

PD69W and PD69X contain the BCD value after the FTB subroutine.

SUBREGIONS AND SUBROUTINES USED:

FTB

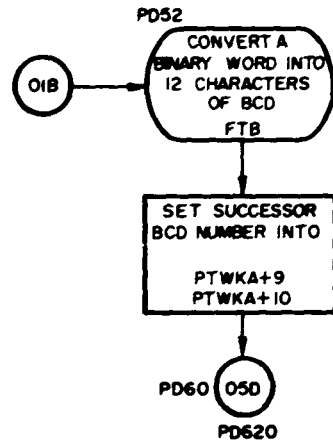
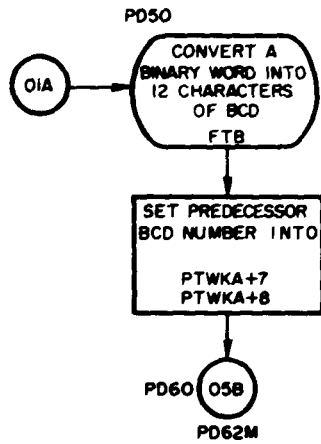
EXPLANATION OF CALLING SEQUENCE:

At the end of this routine, control is transferred back to the predecessor or successor area.

REGION PD50

CONVERT BINARY PE  
NUMBER TO BCD

CONVERT BINARY SE  
NUMBER TO BCD



Region PD55

EXPLANATION OF REGION:

This routine will check the file number between two blocks in the file description area.

CALLING SEQUENCE:

L       TSX   PD55, 4  
L + 1   File number is zero return  
L + 2   File numbers are equal return  
L + 3   File numbers are different return

INPUT:

Old file number in PD99G.

OUTPUT:

Not applicable.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

Not applicable.

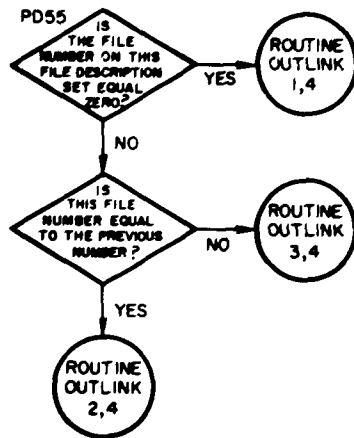
EXPLANATION OF CALLING SEQUENCE:

Not applicable.



REGION PD55

COMPARE FILE NUMBERS  
FROM INPAR FILE  
DESCRIPTION SETS



### Region PD60

#### EXPLANATION OF REGION:

This routine will set up the individual fields from the field description block translation of the USERS TIME TAPE. It will also check sequence on the USERS TIME TAPE.

#### CALLING SEQUENCE:

L      TSX    PD60, 4  
L + 1   Normal return

#### INPUT:

USERS TIME TAPE  
INPAR parameter table

#### OUTPUT:

A selected time information record in the PTWKA block.

#### STORAGE USED:

Not applicable.

#### SUBREGIONS AND SUBROUTINES USED:

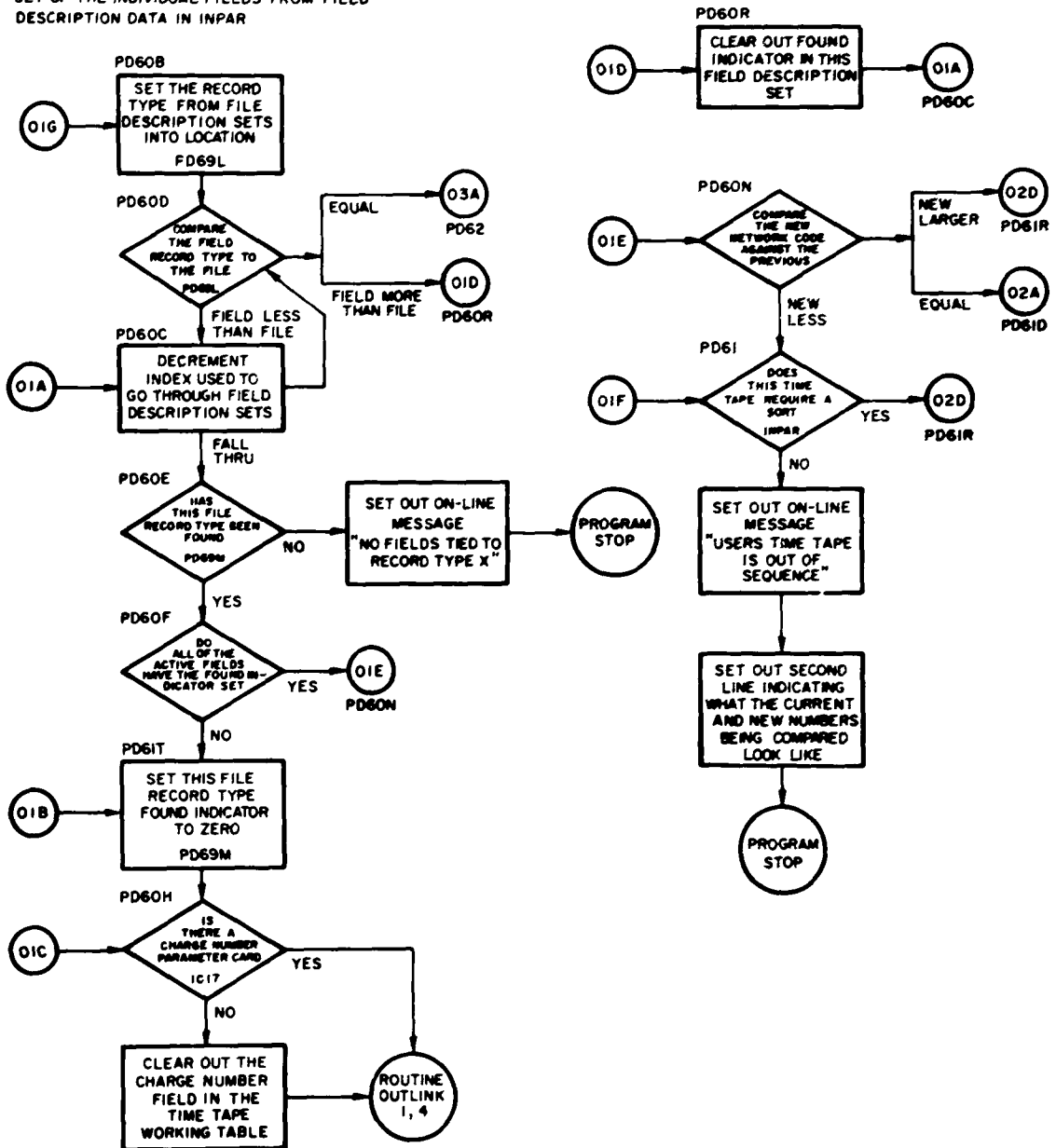
|      |       |      |
|------|-------|------|
| PD68 | WICAR | PD66 |
| PD67 | PD65  |      |

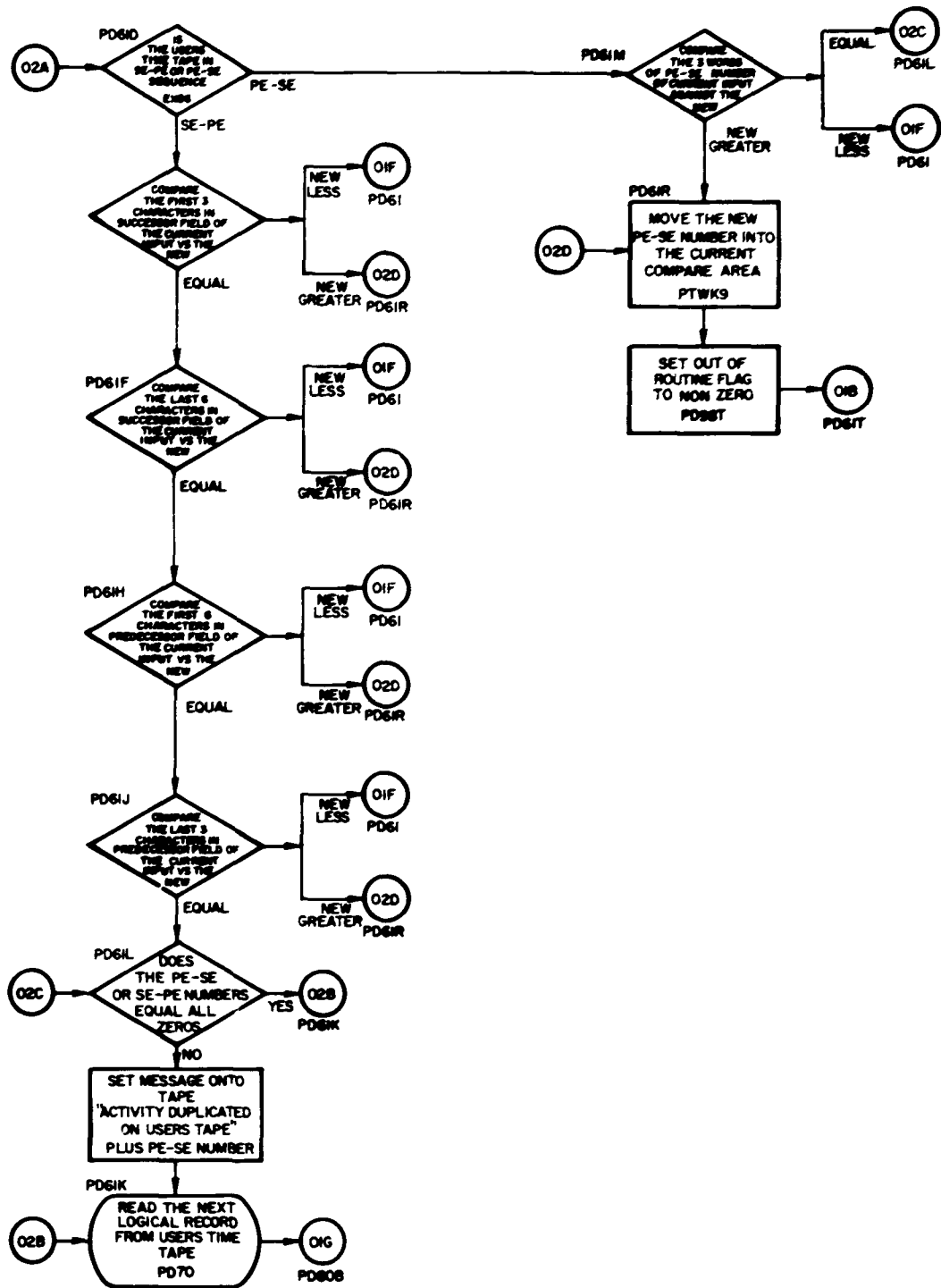
#### EXPLANATION OF CALLING SEQUENCE:

If an error occurs, the reason for the error is set out either on the on-line printer or the SYSTEM ERROR TAPE. The system may then stop if the problem warrants it.

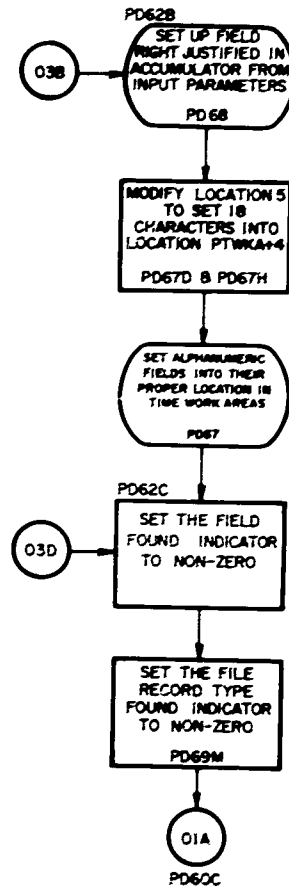
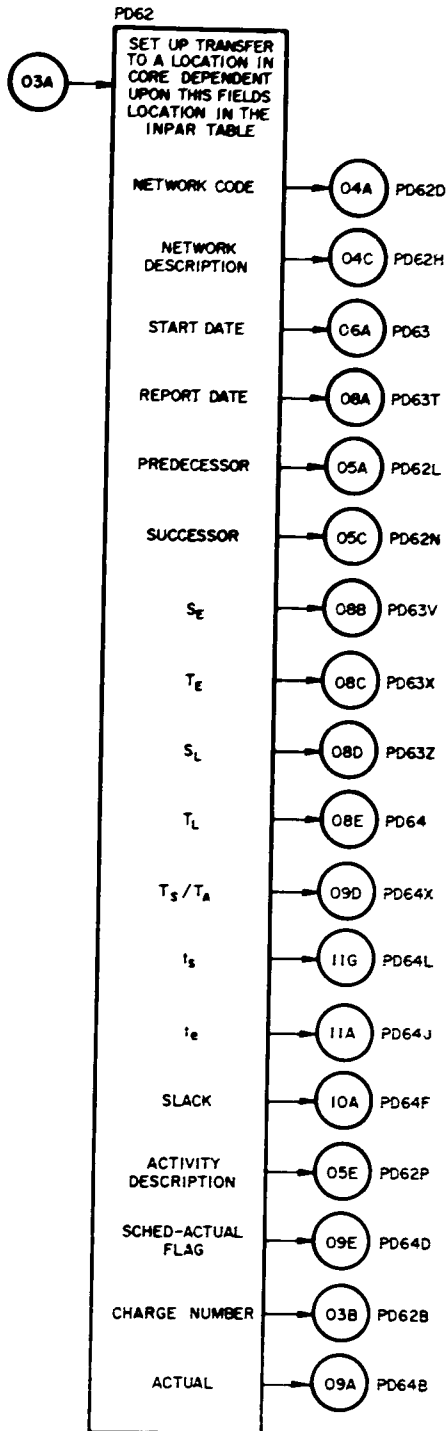
# REGION PD60

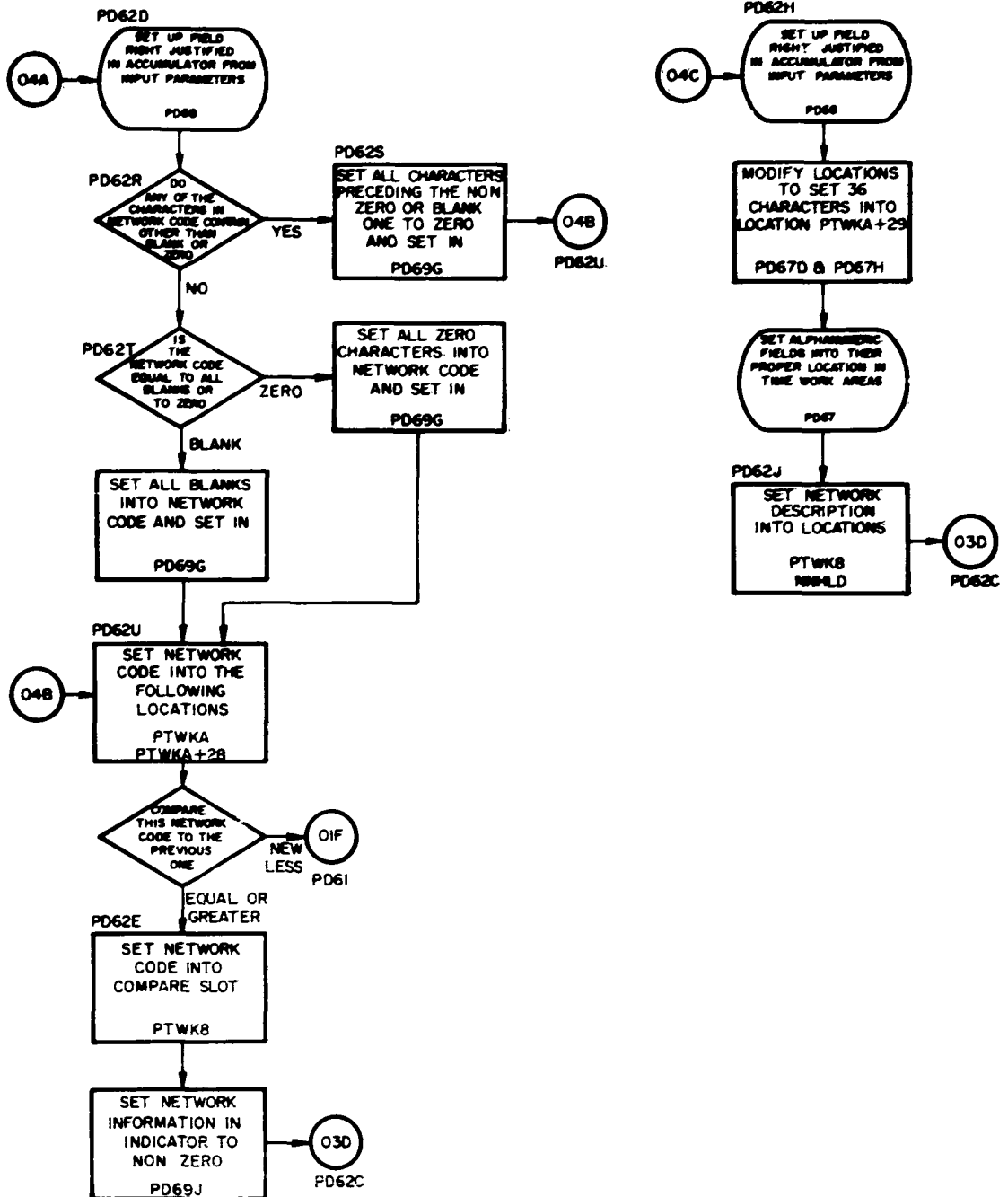
SET UP THE INDIVIDUAL FIELDS FROM FIELD  
DESCRIPTION DATA IN INPAR



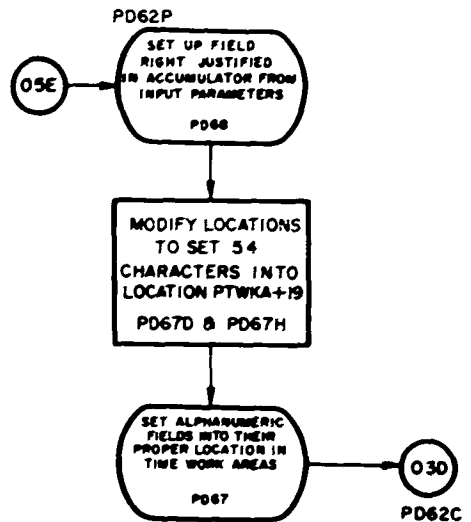
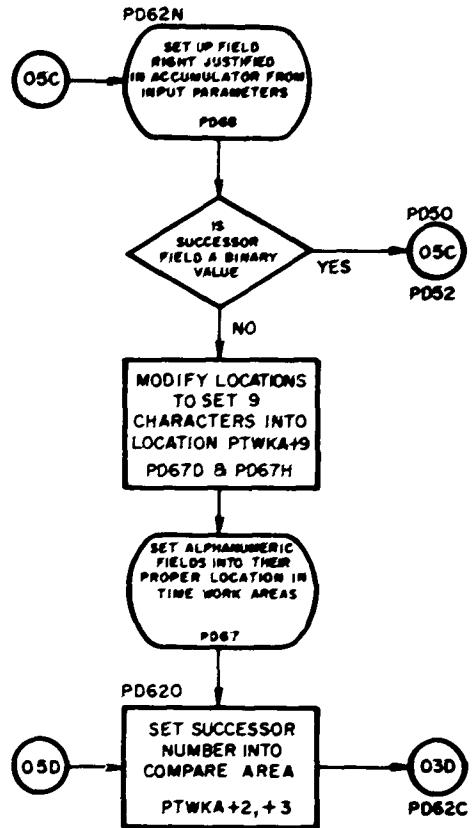
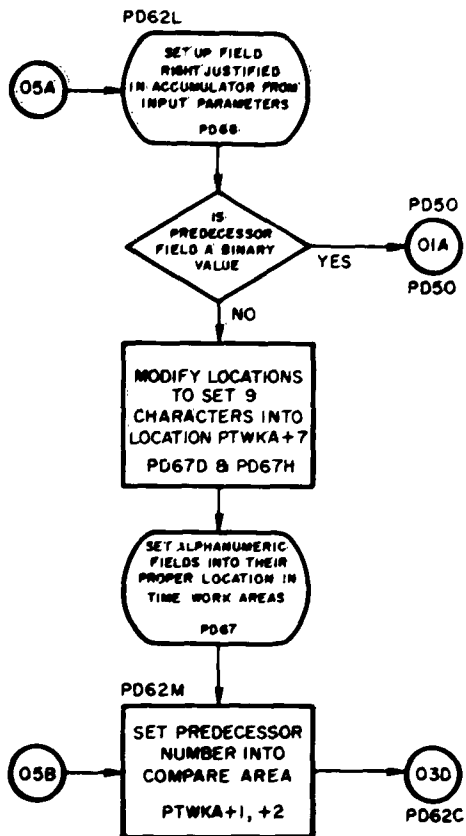


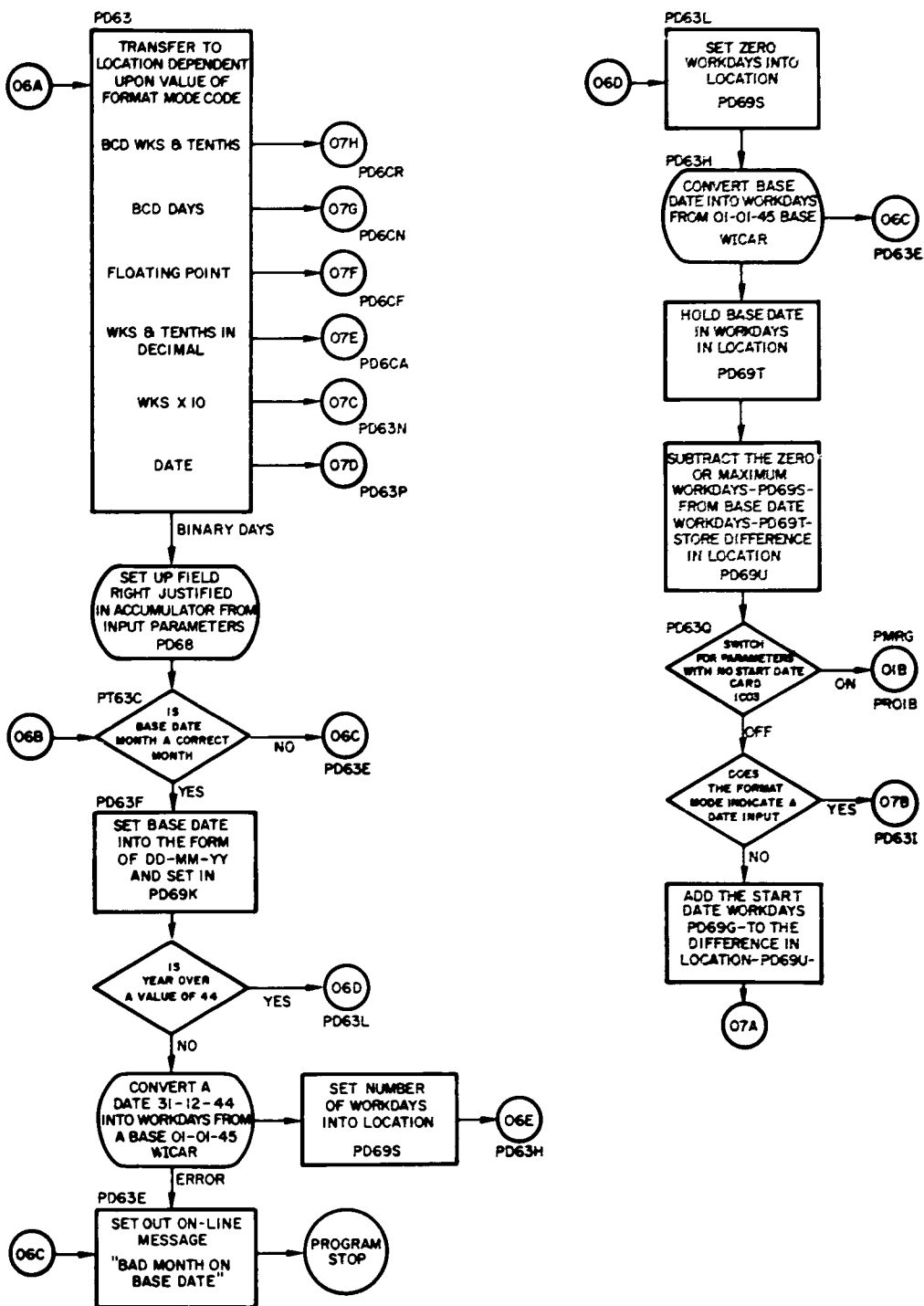
# REGION PD60



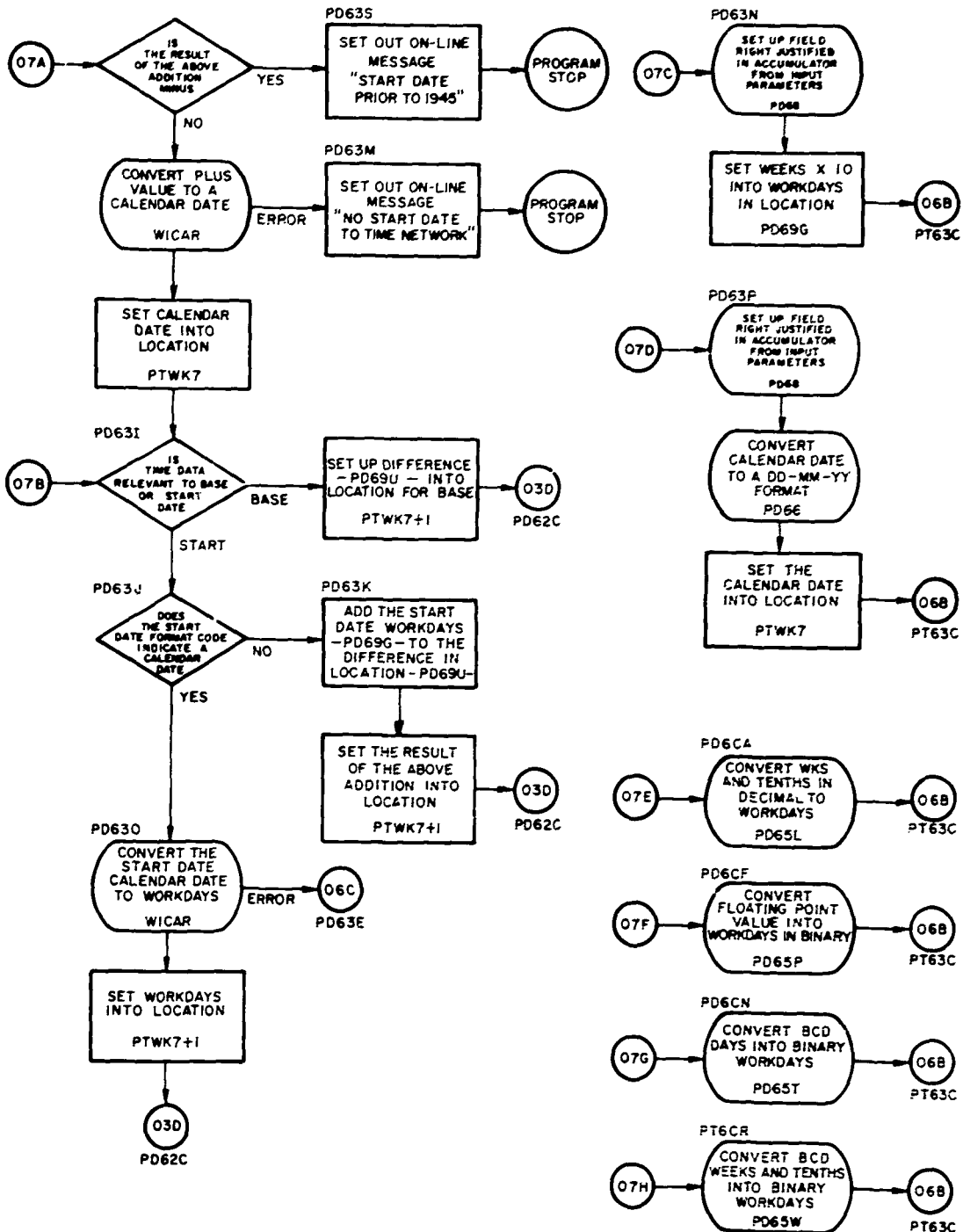


REGION PD60

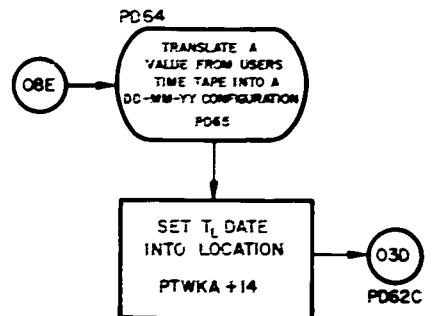
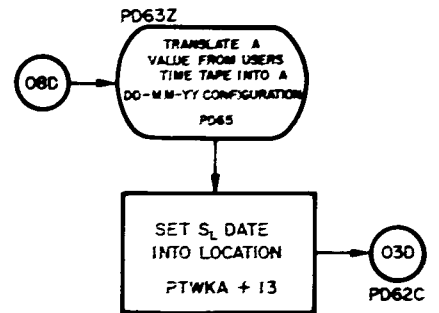
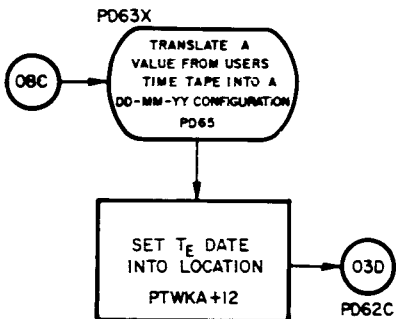
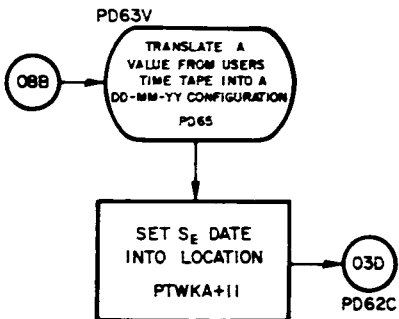
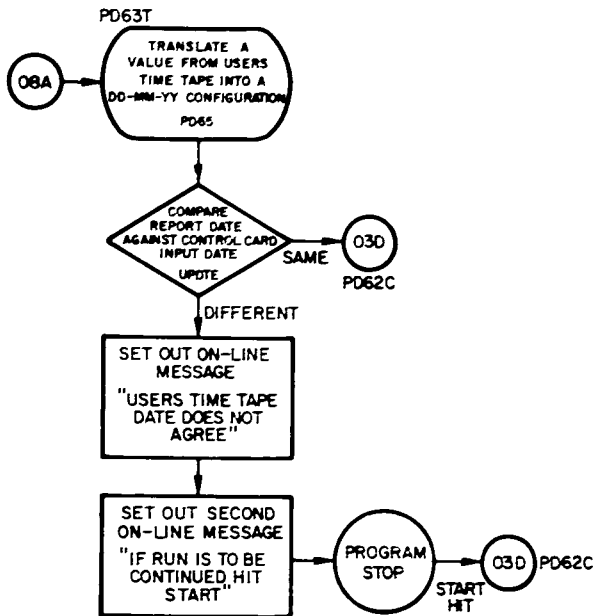








REGION PD60



```

graph TD
 subgraph PD64B
 direction TB
 O9A((09A)) --> D64B{DOES
TS AND TA
USE THE SAME
LOCATION
INPAR+5}
 D64B -- YES --> O9C((09C))
 D64B -- NO --> P64B[TRANSLATE A VALUE
FROM USERS TIME
TAPE INTO A
DD-MM-YY
CONFIGURATION
PD66]
 end
 P64B --> D64C{IS
THERE AN
ACTUAL DATE IN
RECORD}
 D64C -- NO --> O9B((09B))
 D64C -- YES --> P64D[SET DATE
IN LOCATION
PTWKA+15]
 P64D --> D64E{IS
THIS FIELD
THE ACTUAL OR
SCHEDULED
FIELD}
 D64E -- ACTUAL --> P64F[SET AN "A" CODE
INTO ACTUAL OR
SCHEDULED FLAG
PTWKA+35]
 P64F --> O3D((03D))
 D64E -- SCHED --> P64G[SET A BLANK
INTO ACTUAL OR
SCHEDULE FLAG
PTWKA+35]
 O9B --> P64G
 P64G --> O3D
 O3D --> PD62C[PD62C]

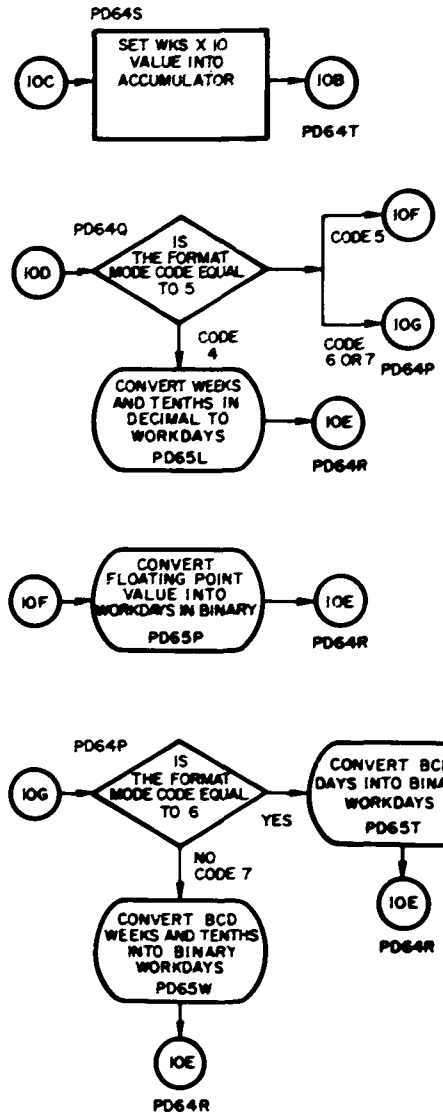
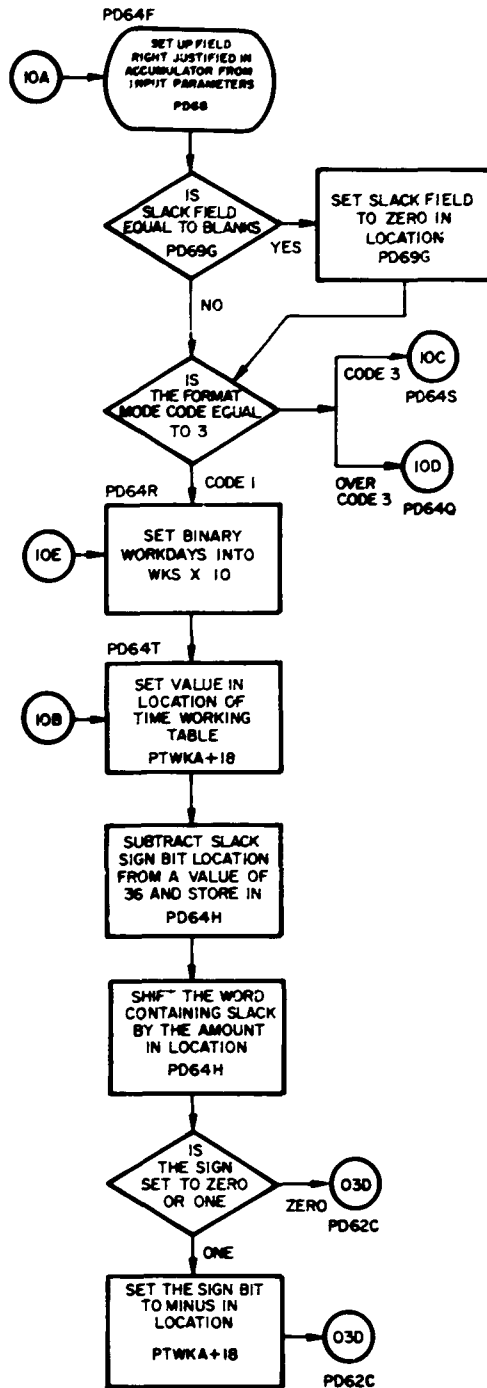
 subgraph PD64E
 direction TB
 O9C --> P64E[TRANSLATE A VALUE
FROM USERS TIME
TAPE INTO A
DD-MM-YY
CONFIGURATION
PD66]
 P64E --> P64D
 end
 P64D --> O3D
 O3D --> PD62C

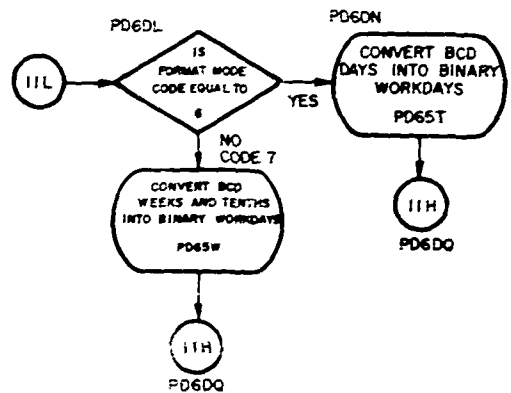
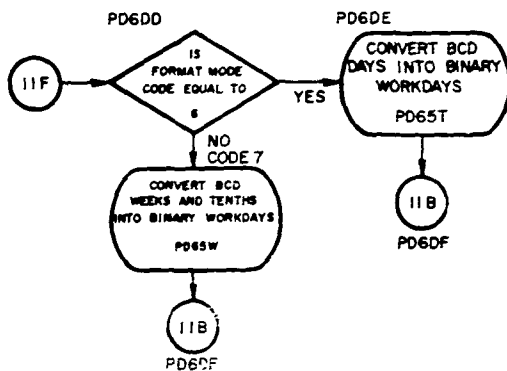
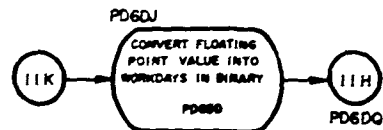
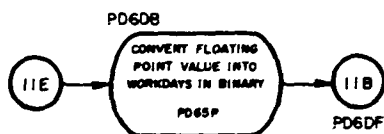
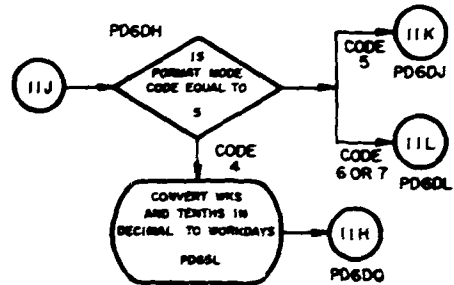
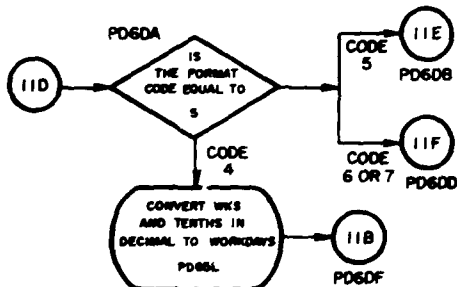
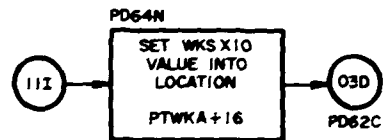
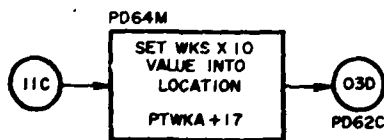
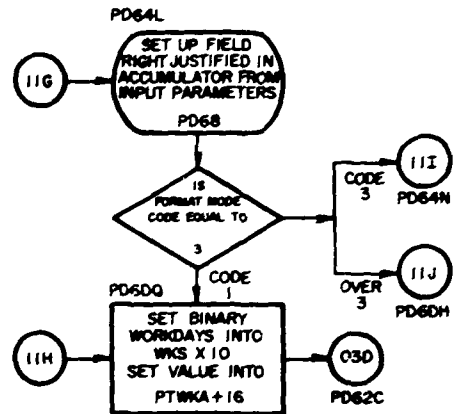
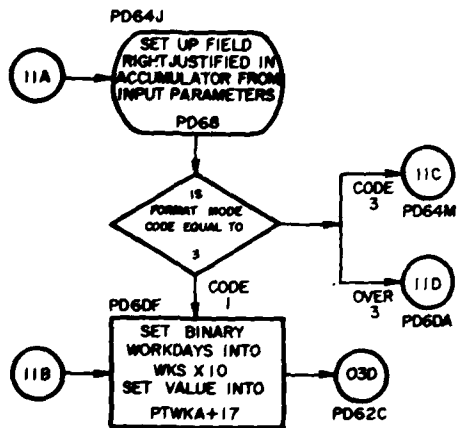
 subgraph PD64X
 direction TB
 O9D((09D)) --> P64X[SET ZERO INTO
LOCATION FOR
TS / TA VALUE
PTWKA+15]
 P64X --> O9A
 end
 O9A --> PD64B

 subgraph PD64D
 direction TB
 O9E((09E)) --> P64D[SET UP FIELD
RIGHT JUSTIFIED
IN ACCUMULATOR
FROM INPUT
PARAMETERS
PD68]
 P64D --> D64F{DOES
TS AND TA
USE THE SAME
LOCATION
INPAR+5}
 D64F -- NO --> O3D
 D64F -- YES --> D64G{DOES
THE CODE ON
THE TAPE EQUAL
THE ACTUAL CODE
INPAR+4}
 D64G -- YES --> O9F((09F))
 D64G -- NO --> P64H[SET A BLANK
INTO ACTUAL OR
SCHEDULE FLAG
PTWKA+35]
 P64H --> O3D
 end
 O9F --> P64I[SET AN "A" CODE
INTO ACTUAL OR
SCHEDULE FLAG
PTWKA+35]
 P64I --> O3D
 O3D --> PD62C

 O3D --> PD62C
 O9F --> PD64G
 PD64G --> O3D
 O3D --> PD62C

```





Region PD65

**EXPLANATION OF REGION:**

This routine will translate the date fields from the **USERS TIME TAPE** such as S<sub>E</sub>, S<sub>L</sub>, T<sub>E</sub>, T<sub>L</sub>, T<sub>A</sub>, and T<sub>S</sub> into a DD-MM-YY configuration for the PTWKA block.

**CALLING SEQUENCE:**

L        TSX    PD65, 4  
L + 1    Normal return

**INPUT:**

USERS TIME TAPE  
INPAR parameter table

**OUTPUT:**

In the accumulator will be the date in a DD-MM-YY configuration to be set into PTWKA.

**STORAGE USED:**

Not applicable.

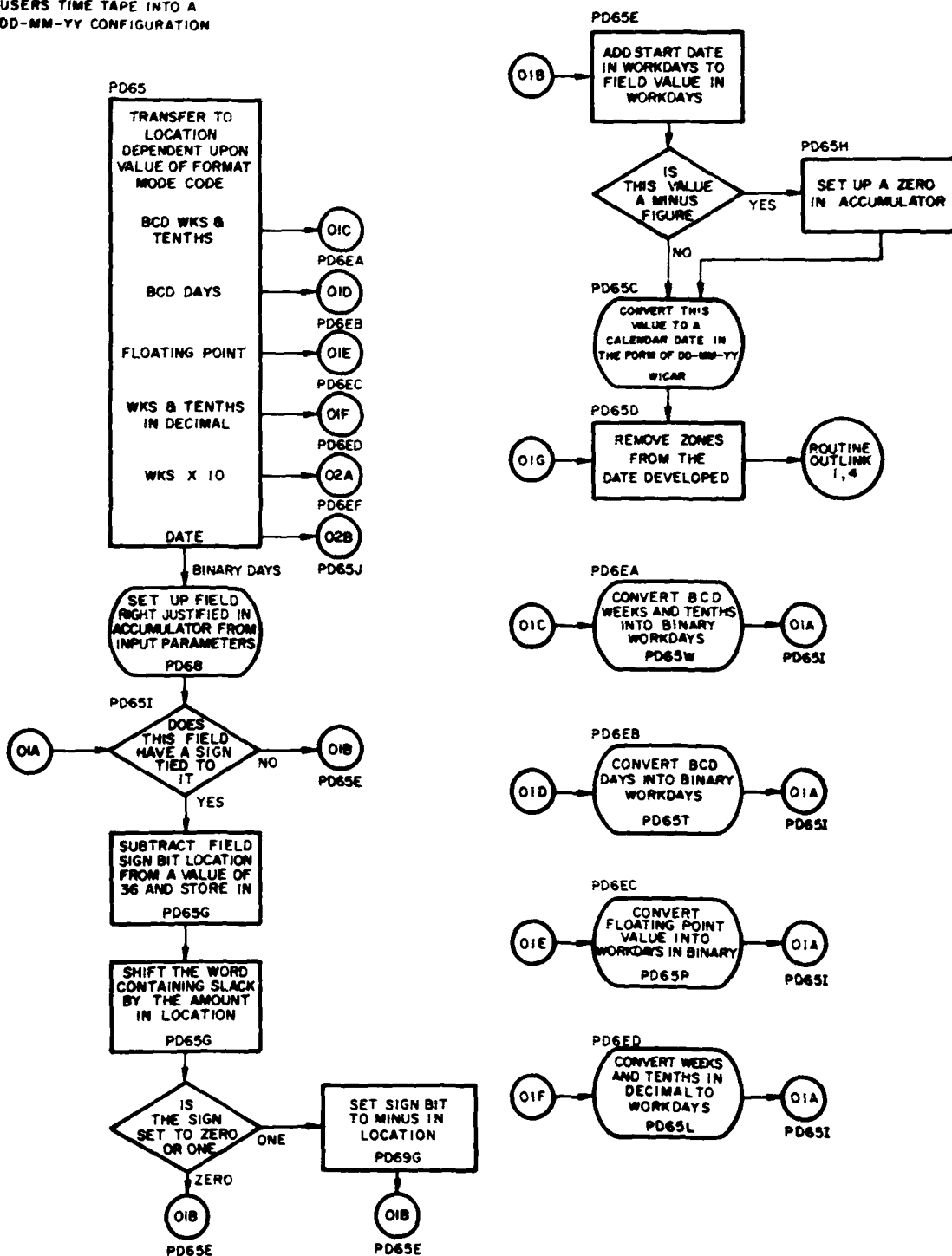
**SUBREGIONS AND SUBROUTINES USED:**

PD68 PD66  
WICAR

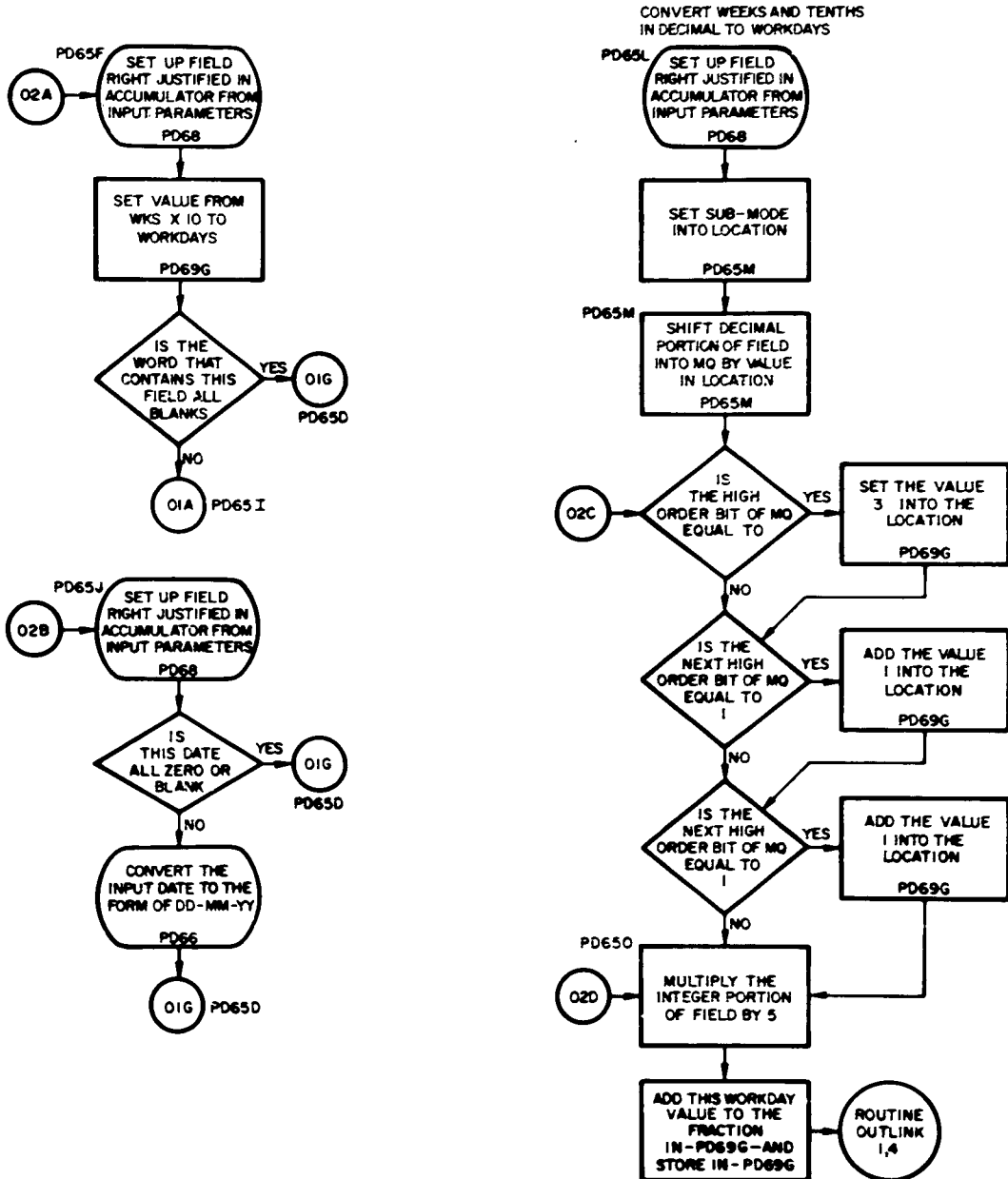
**EXPLANATION OF CALLING SEQUENCE:**

**Not applicable.**

TRANSLATE A VALUE FROM  
USERS TIME TAPE INTO A  
DD-MM-YY CONFIGURATION



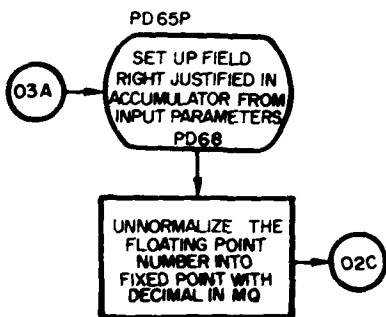
REGION-PD68



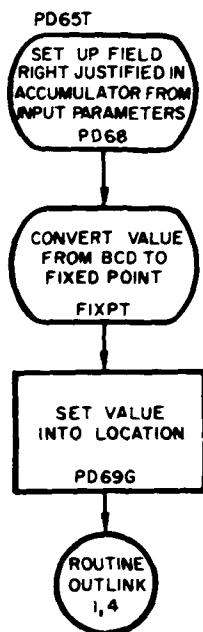


REGION PD66

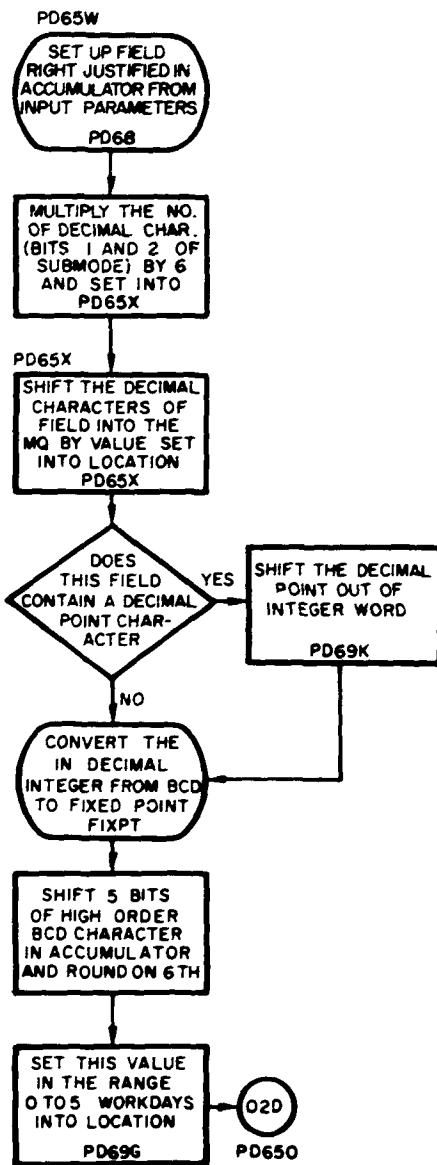
CONVERT FLOATING POINT  
IN WEEKS AND DECIMAL  
TENTHS TO WORKDAYS



CONVERT BCD DAYS  
INTO BINARY WORKDAYS



CONVERT BCD WEEKS  
AND TENTHS INTO  
BINARY WORKDAYS



Region PD66

EXPLANATION OF REGION:

This routine will convert a date to a DD-MM-YY mode if the date is a calendar date, but is set up in a different configuration.

CALLING SEQUENCE:

L       TSX   PD66, 4

L + 1   Normal return

INPUT:

Calendar date in location PD69G.

OUTPUT:

In the accumulator will be the date in a DD-MM-YY configuration to be set into PTWKA.

STORAGE USED:

Not applicable.

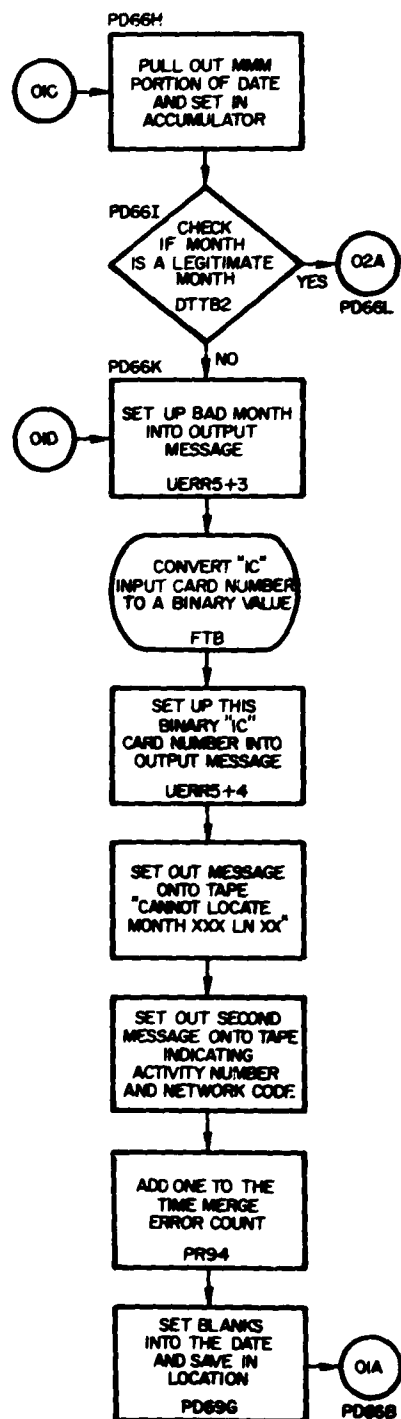
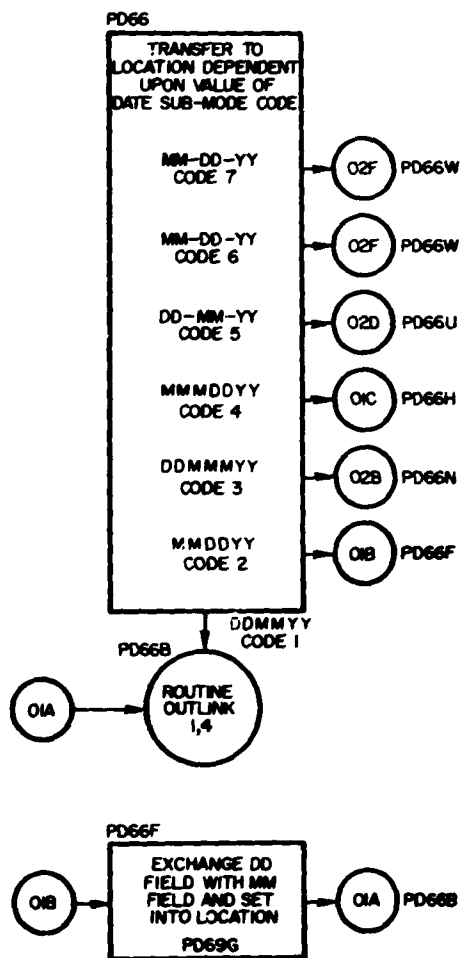
SUBREGIONS AND SUBROUTINES USED:

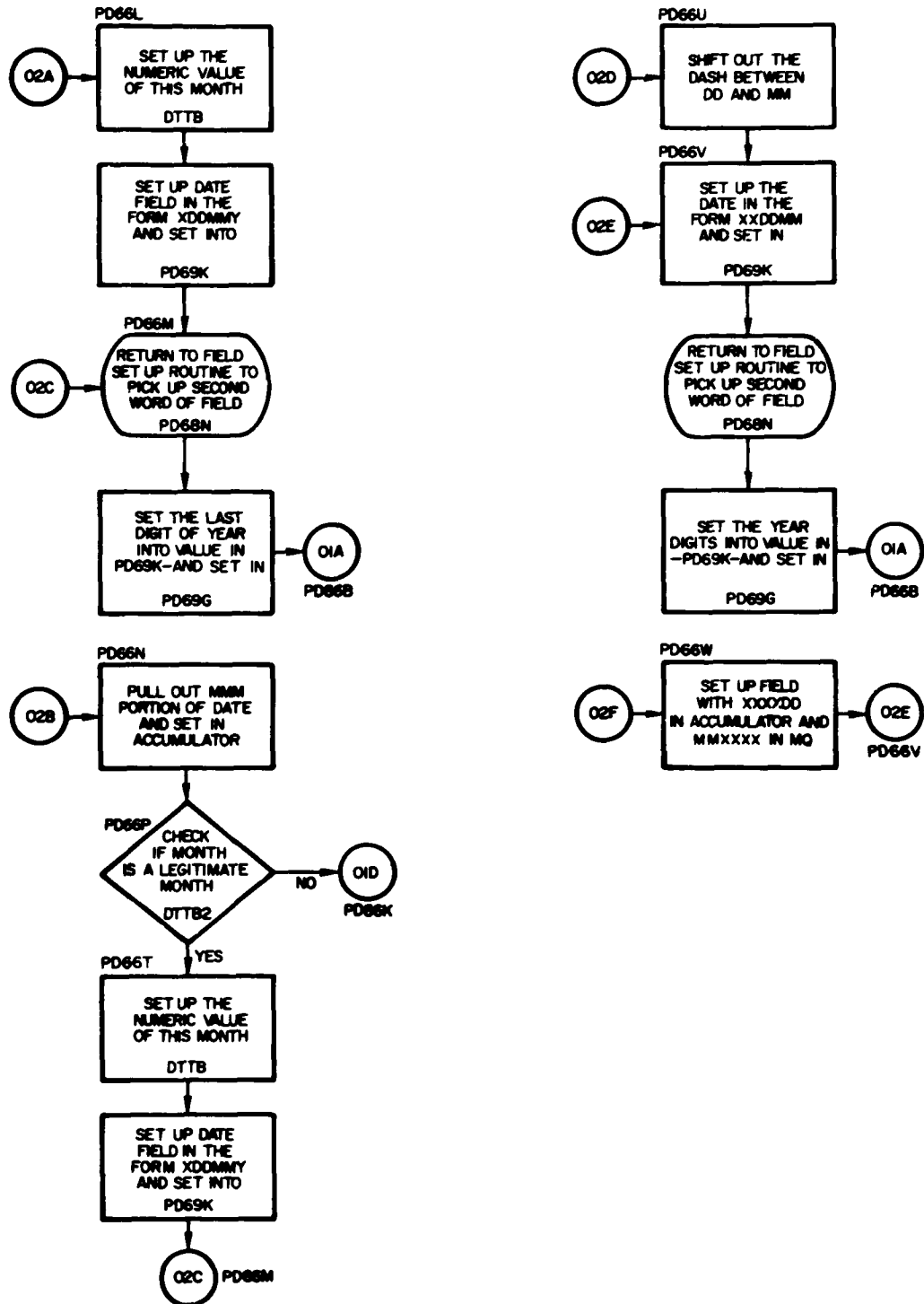
PD68

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

CONVERT A DATE  
INTO A DD-MM-YY  
FORMAT





Region PD67

**EXPLANATION OF REGION:**

This routine will set the alpha-numeric fields into PTWKA, which may range from 1 character to 9 words or 54 characters.

**CALLING SEQUENCE:**

L      TSX    PD67, 4

L + 1   Normal return

**INPUT:**

USERS TIME TAPE and INPAR parameter table.

The following locations will be modified when routine is used:

PD67D - number of characters in field

PD67H - location in PTWKA where this field is to be started.

**OUTPUT:**

The selected time information field set up in the PTWKA block.

**STORAGE USED:**

Not applicable.

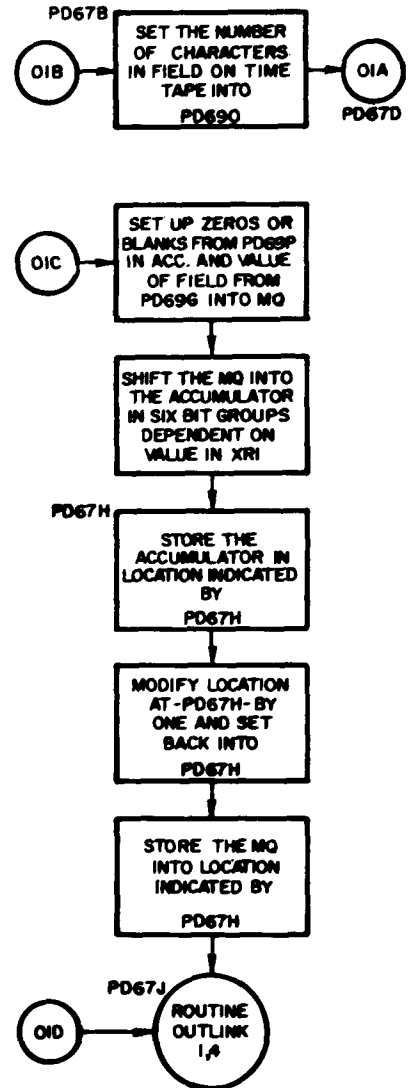
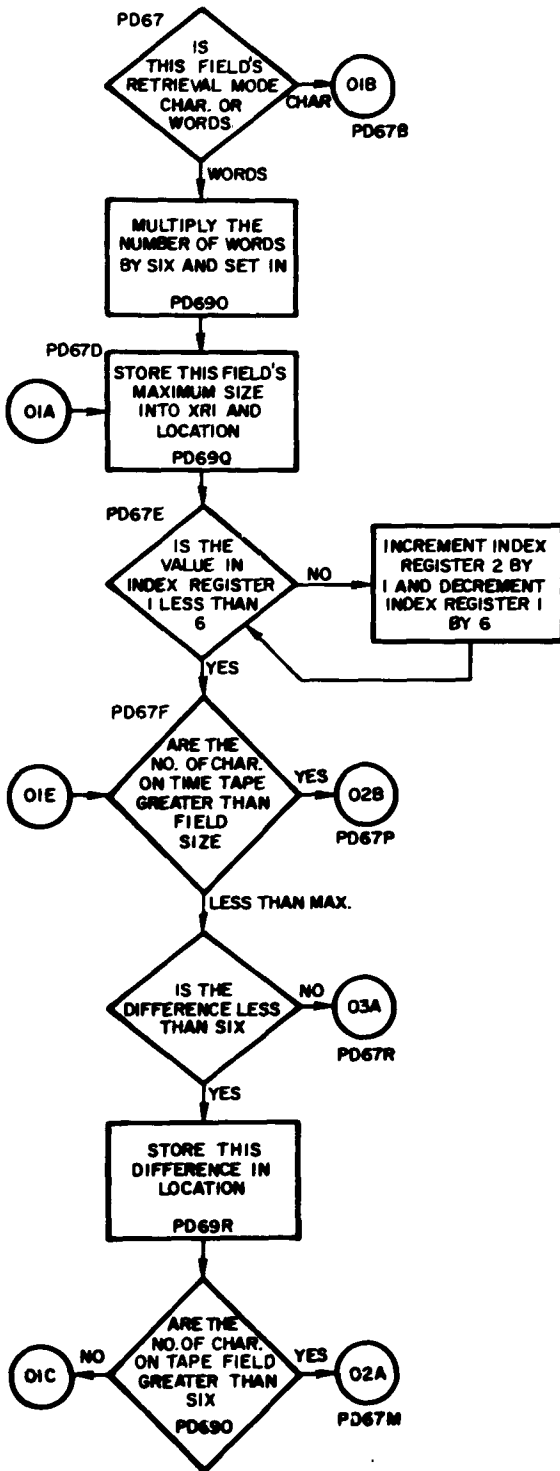
**SUBREGIONS AND SUBROUTINES USED:**

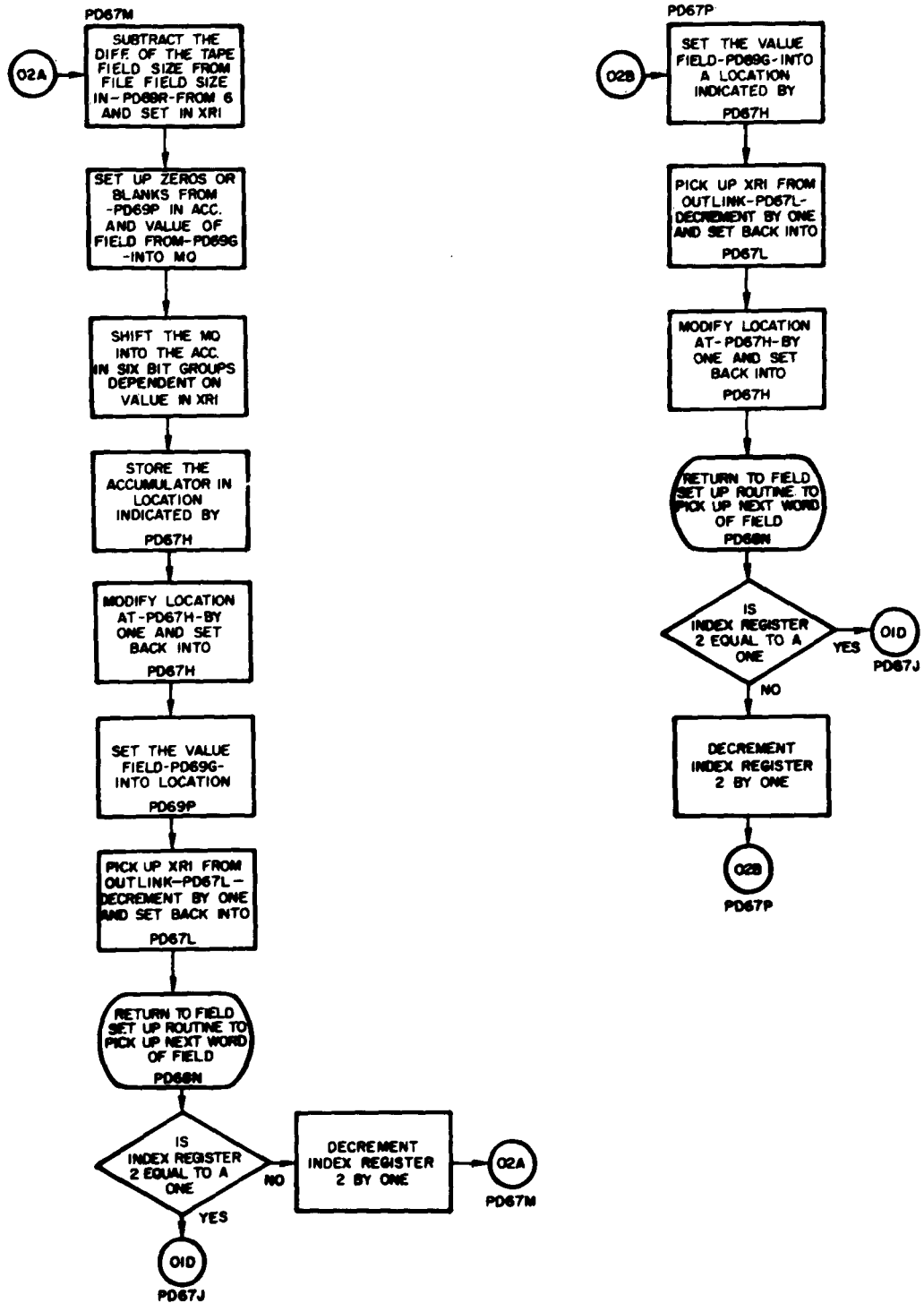
Not applicable.

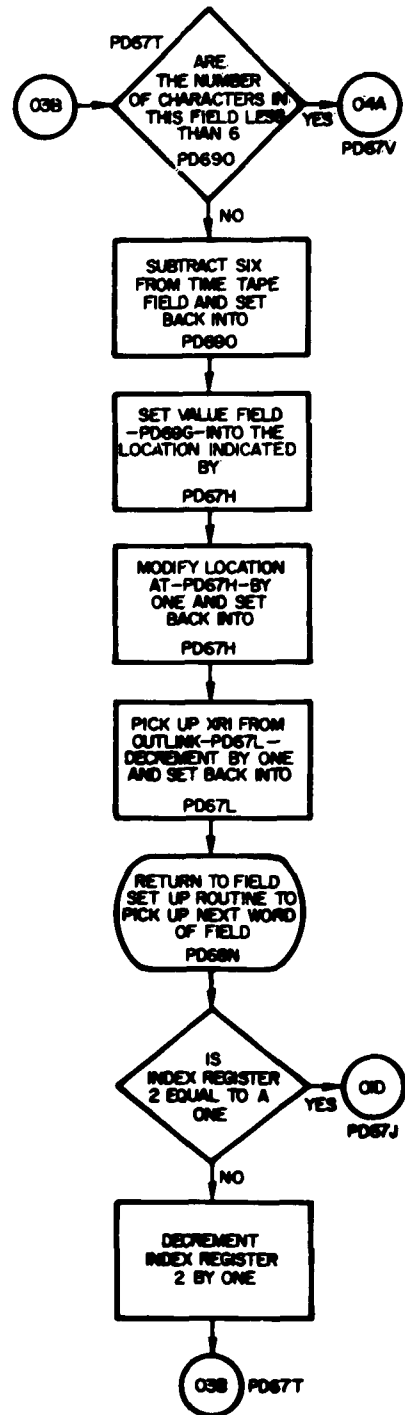
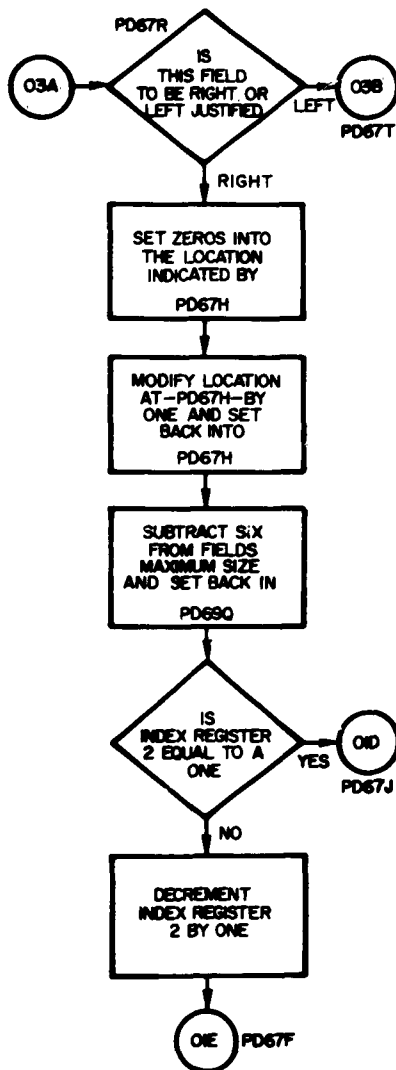
**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.

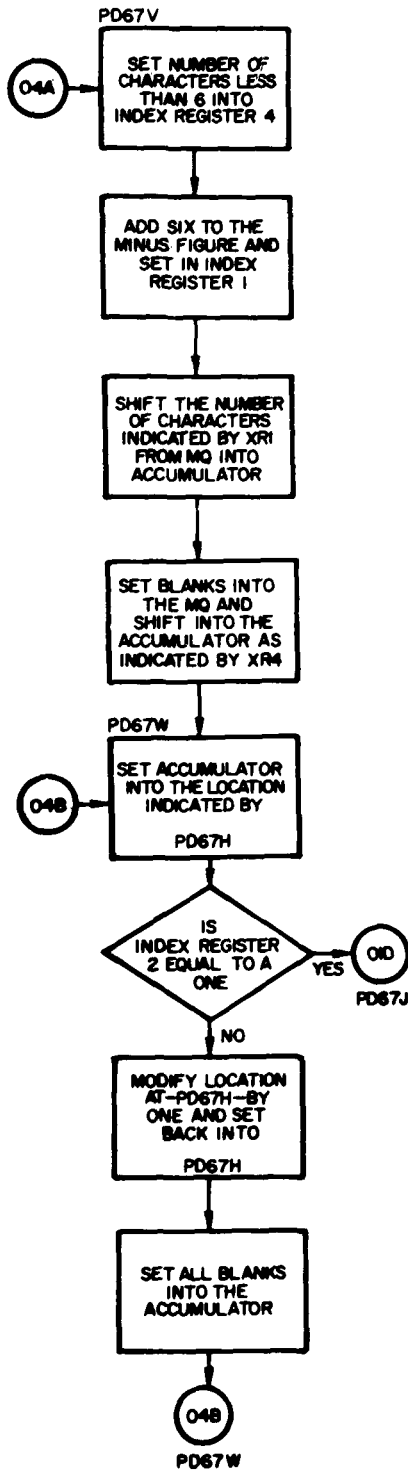
SET ALPHA NUMERIC FIELDS  
INTO TIME WORKING AREA (PTWKA)











### Region PD68

#### EXPLANATION OF REGION:

This routine will pick up the data from a location in core that contains the USERS TIME TAPE information and will set it into a computer word PD69G for further processing.

#### CALLING SEQUENCE:

L       TSX   PD68, 4  
L + 1   Normal return

#### INPUT:

The USERS TIME TAPE and INPAR table.

The following locations will be modified according to the information in the field description blocks:

PD68B - the word location in the record that the first part of this field is located.

PD68D - the word location, if any, that the next part of field is located.

PD68F - the shifting necessary to get a full word of field.

PD68H - the masking necessary to set up this field.

PD68J - the blanks necessary to make this field usable.

#### OUTPUT:

The usable field located in PD69G.

#### STORAGE USED:

Not applicable.

#### SUBREGIONS AND SUBROUTINES USED:

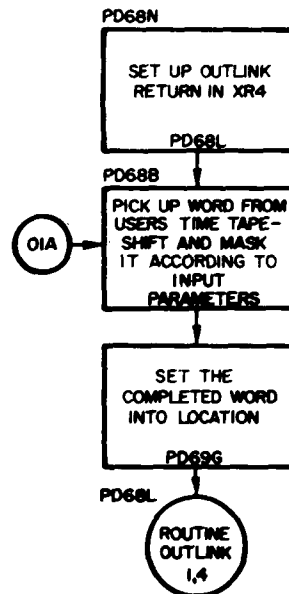
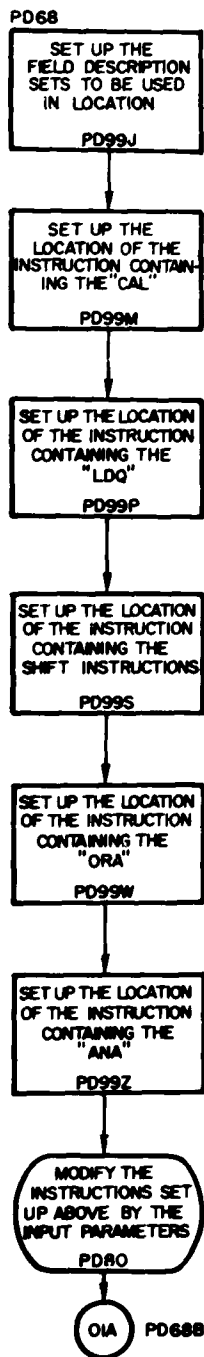
PD80

#### EXPLANATION OF CALLING SEQUENCE:

Not applicable.

SET UP FIELDS  
FROM INPUT PARAMETERS

SET UP A SECOND OR  
ADDITIONAL FIELD FROM  
INPUT PARAMETERS



### Region PD70

#### EXPLANATION OF REGION:

This routine will do the reading of the USERS TIME TAPE from the file description section of the INPAR table.

#### CALLING SEQUENCE:

L       TSX   PD70, 4

L + 1   Normal return

#### INPUT:

The USERS TIME TAPE and INPAR table

The following locations will be modified according to the information in the field description block in order to develop the variable count field.

PD71   - the word location in the record that the first part of this field is located.

PD72   - the word location, if any, that next part of field is located

PD73   - the shifting necessary to get a full word of field.

PD73A   - the masking necessary to set up this field.

PD74   - the blanks necessary to make this field usable.

#### OUTPUT:

A record from the USERS TIME TAPE to be processed.

#### STORAGE USED:

Not applicable.

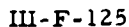
#### SUBREGIONS AND SUBROUTINES USED:

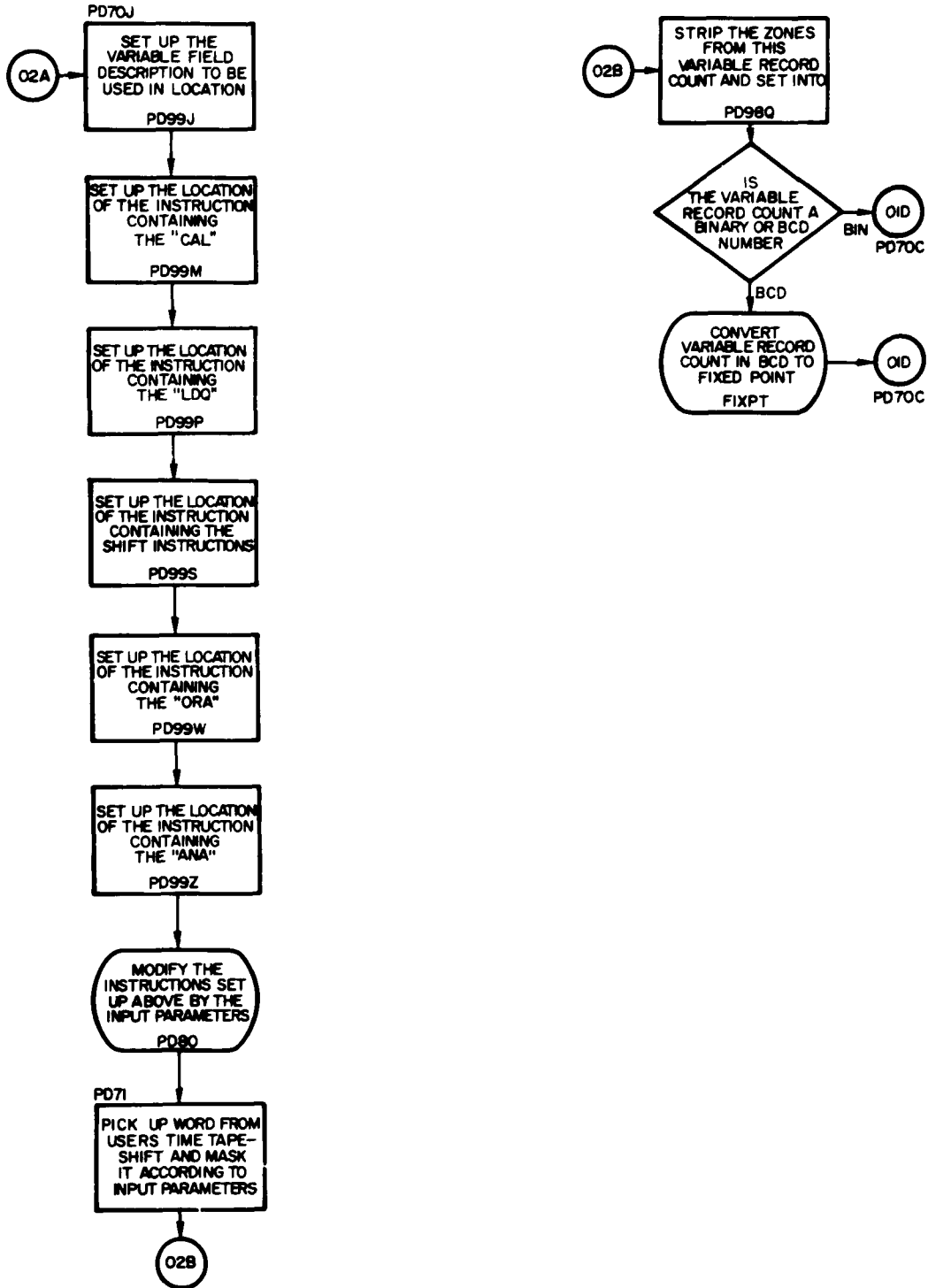
READ                               FIXPT

PD80

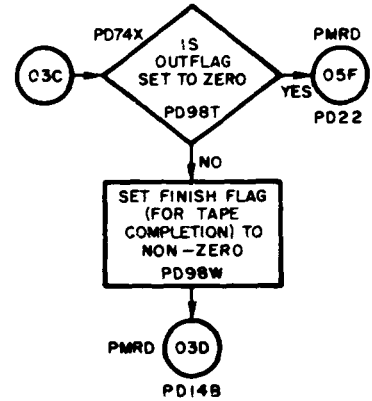
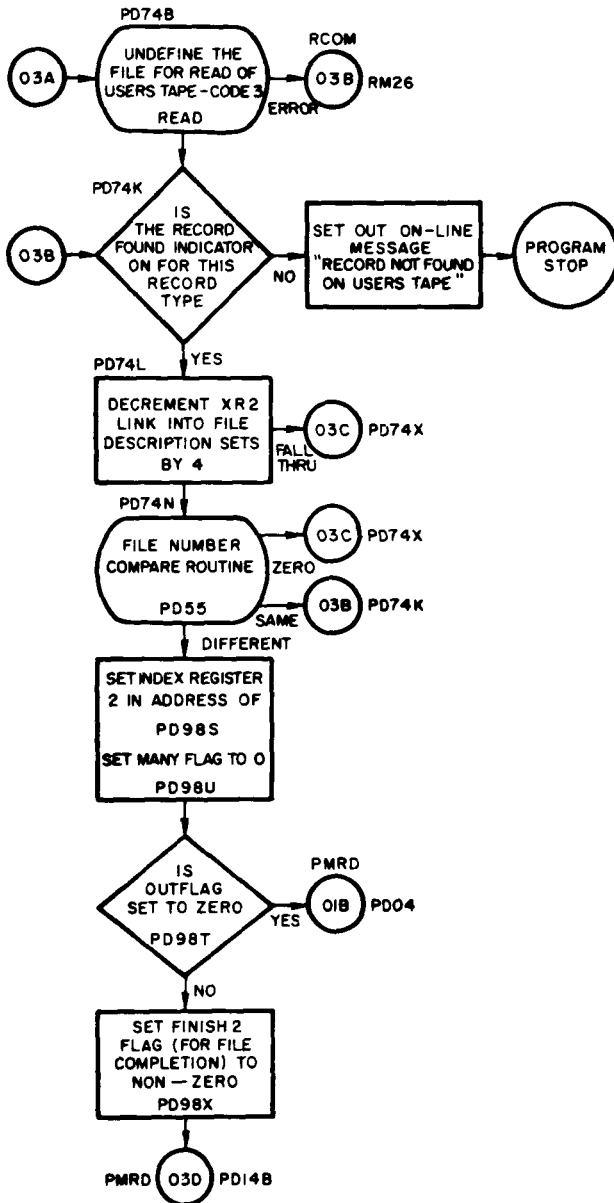
#### EXPLANATION OF CALLING SEQUENCE:

If E. O. F. or read errors are determined, the outlink will be to the read routines Page III-B-2. If an error occurs a message will be set out on-line and the system will stop.





REGION PD70



### Region PD75

#### EXPLANATION OF REGION:

This routine will develop the ID record from the USERS TIME TAPE and compare it with the ID records in the file description blocks of the INPAR table.

#### CALLING SEQUENCE:

L       TSX   PD75, 4  
L + 1   Record ID not found return  
L + 2   Record ID found return

#### INPUT:

The USERS TIME TAPE and INPAR table

The following locations will be modified according to the information in the field description block to develop the ID for each USERS TIME TAPE record.

PD76   - the word location in the record that the first part of the ID is located.  
PD77   - the word location, if any, that the next part of field is located.  
PD78   - the shifting necessary to get a full word of field.  
PD78A   - the masking necessary to set up this field.  
PD79   - the blanks necessary to make this field usable.

#### OUTPUT:

Not applicable.

#### STORAGE USED:

Not applicable.

#### SUBREGIONS AND SUBROUTINES USED:

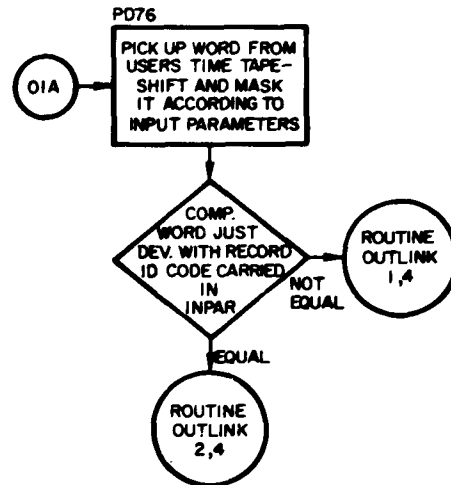
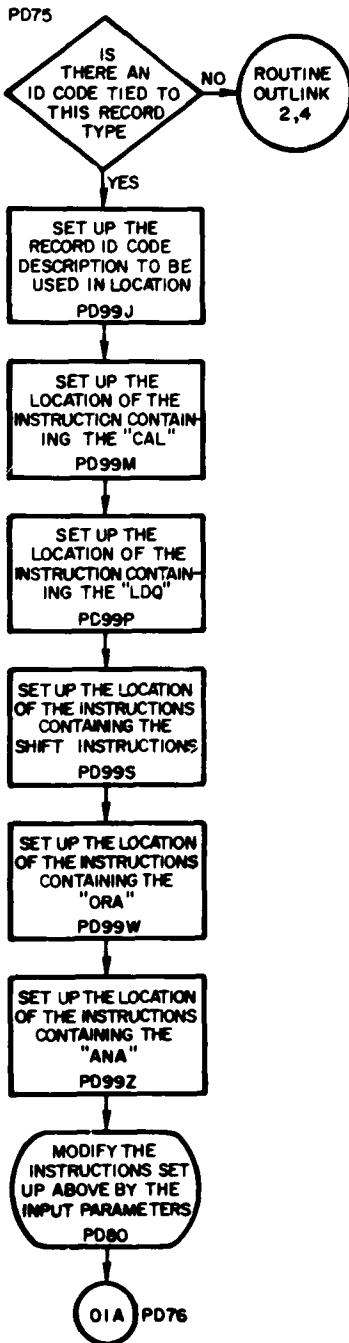
PD80

#### EXPLANATION OF CALLING SEQUENCE:

Not applicable.



CHECK THE ID CODE OF THE RECORDS



Region PD80

EXPLANATION OF REGION:

This routine will set up the parameters used to read the fields in PD68, PD70 and PD75 from the INPAR table.

CALLING SEQUENCE:

L       TSX   PD80, 4

L + 1   Normal return

INPUT:

INPAR parameter table

OUTPUT:

Modify fields in PD68, PD70, and PD75.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

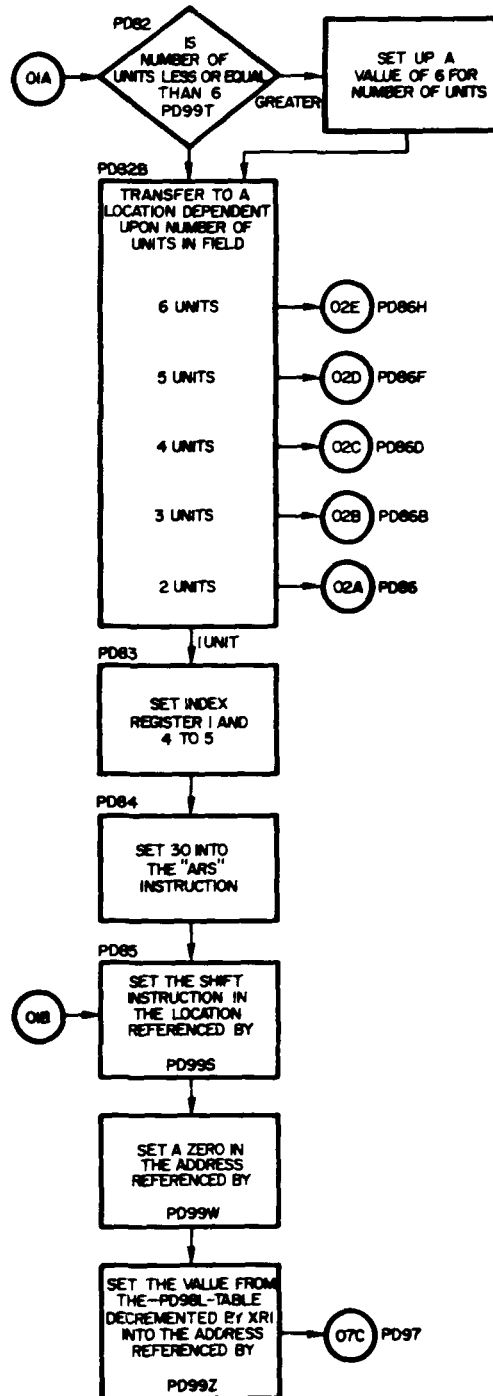
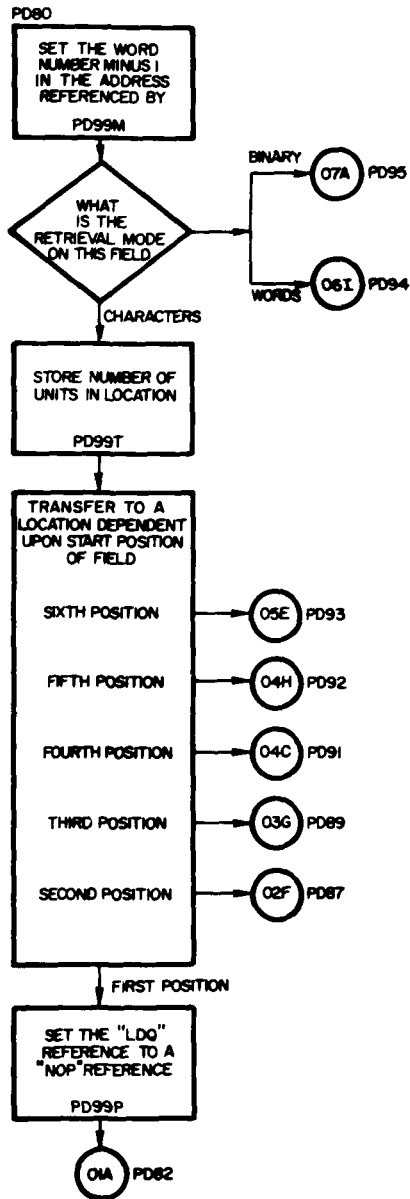
Not applicable.

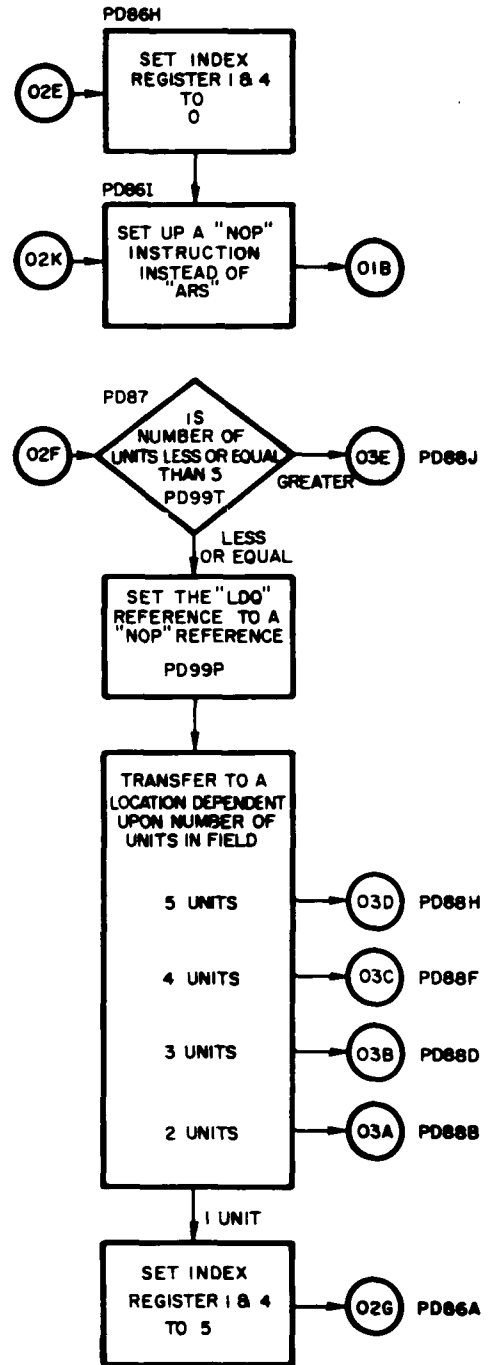
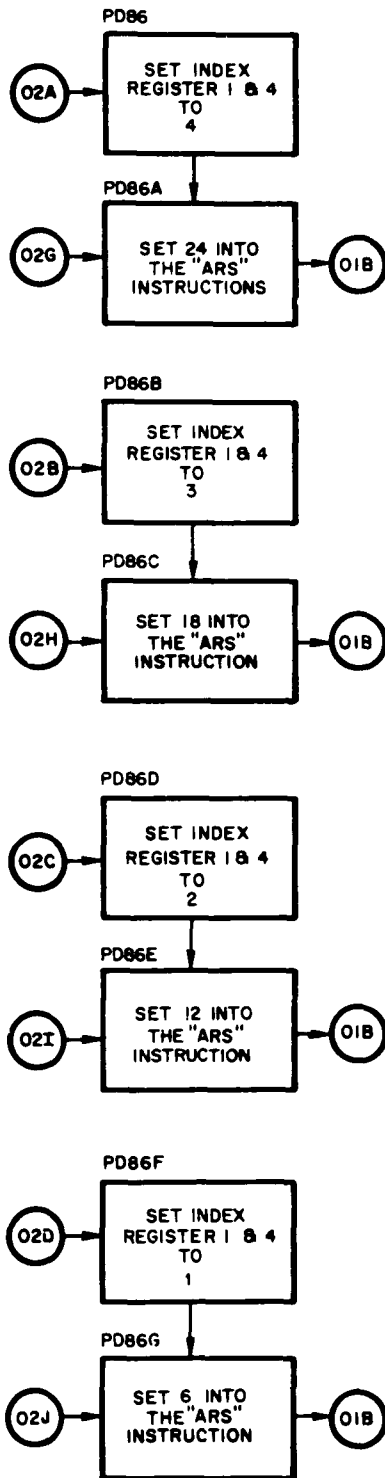
EXPLANATION OF CALLING SEQUENCE:

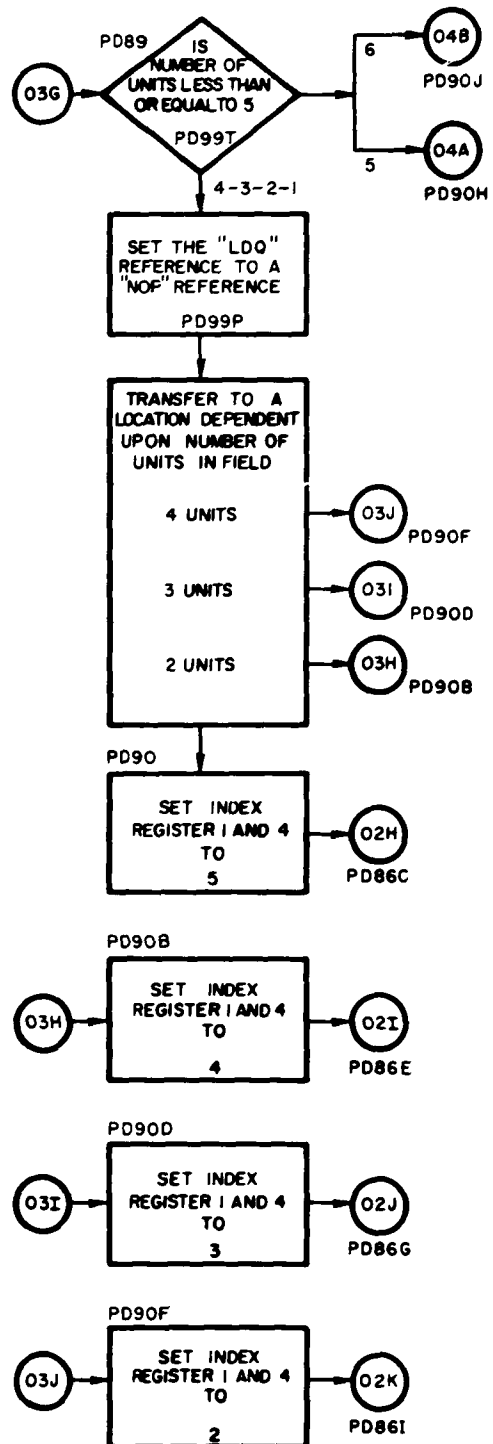
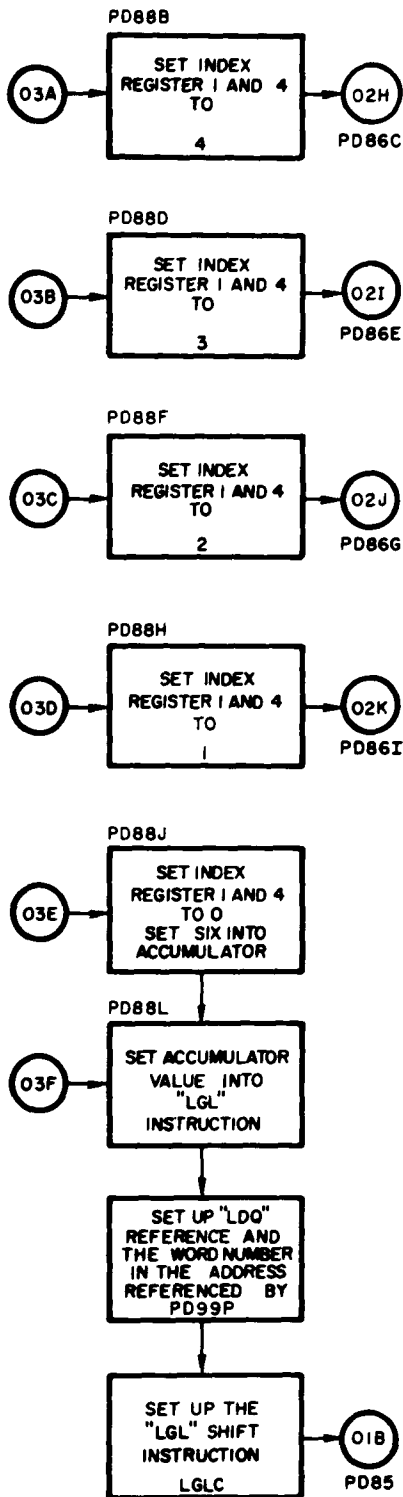
Not applicable.

# REGION PD80

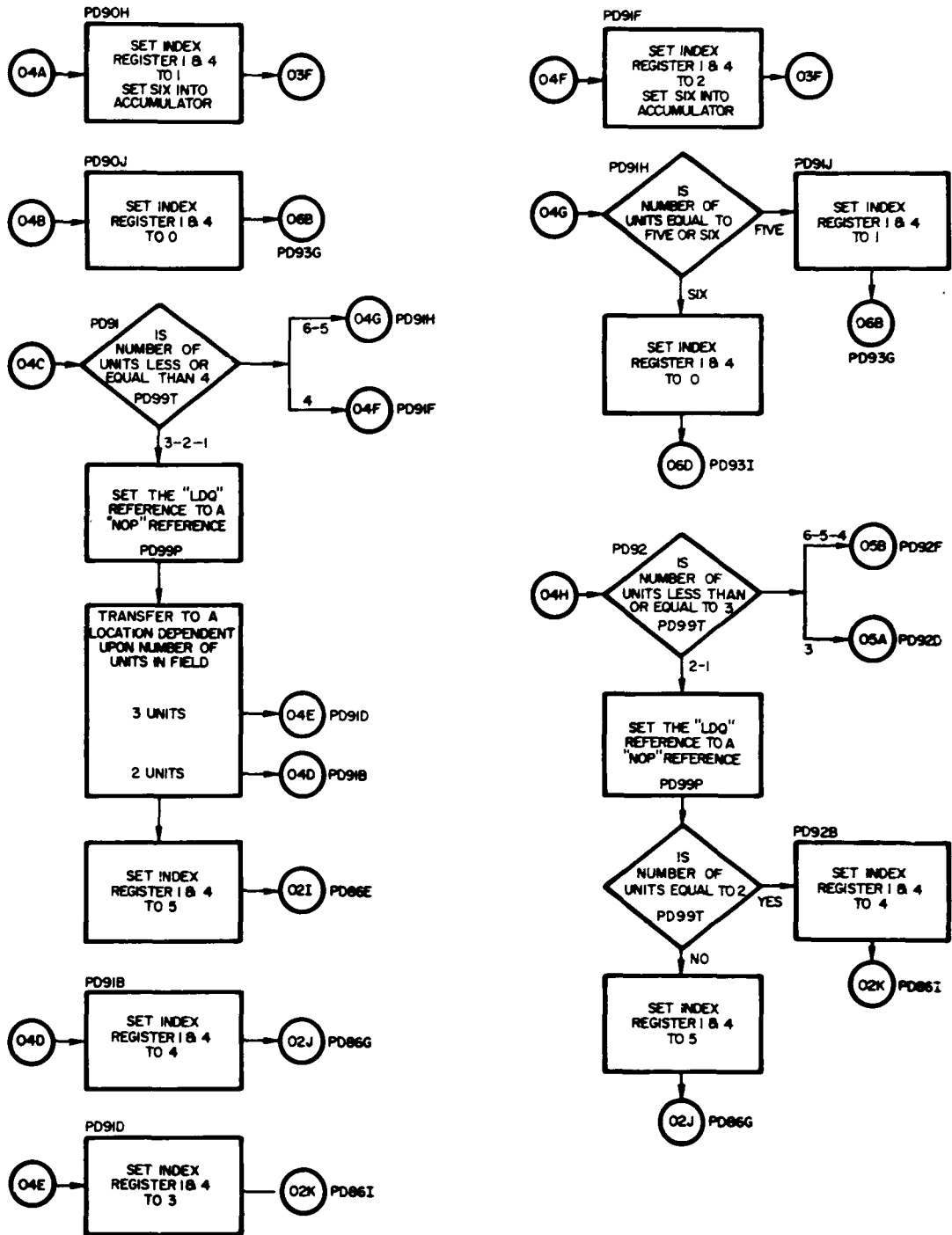
MODIFY THE INSTRUCTIONS  
TO READ A FIELD FROM  
USERS TIME TAPE



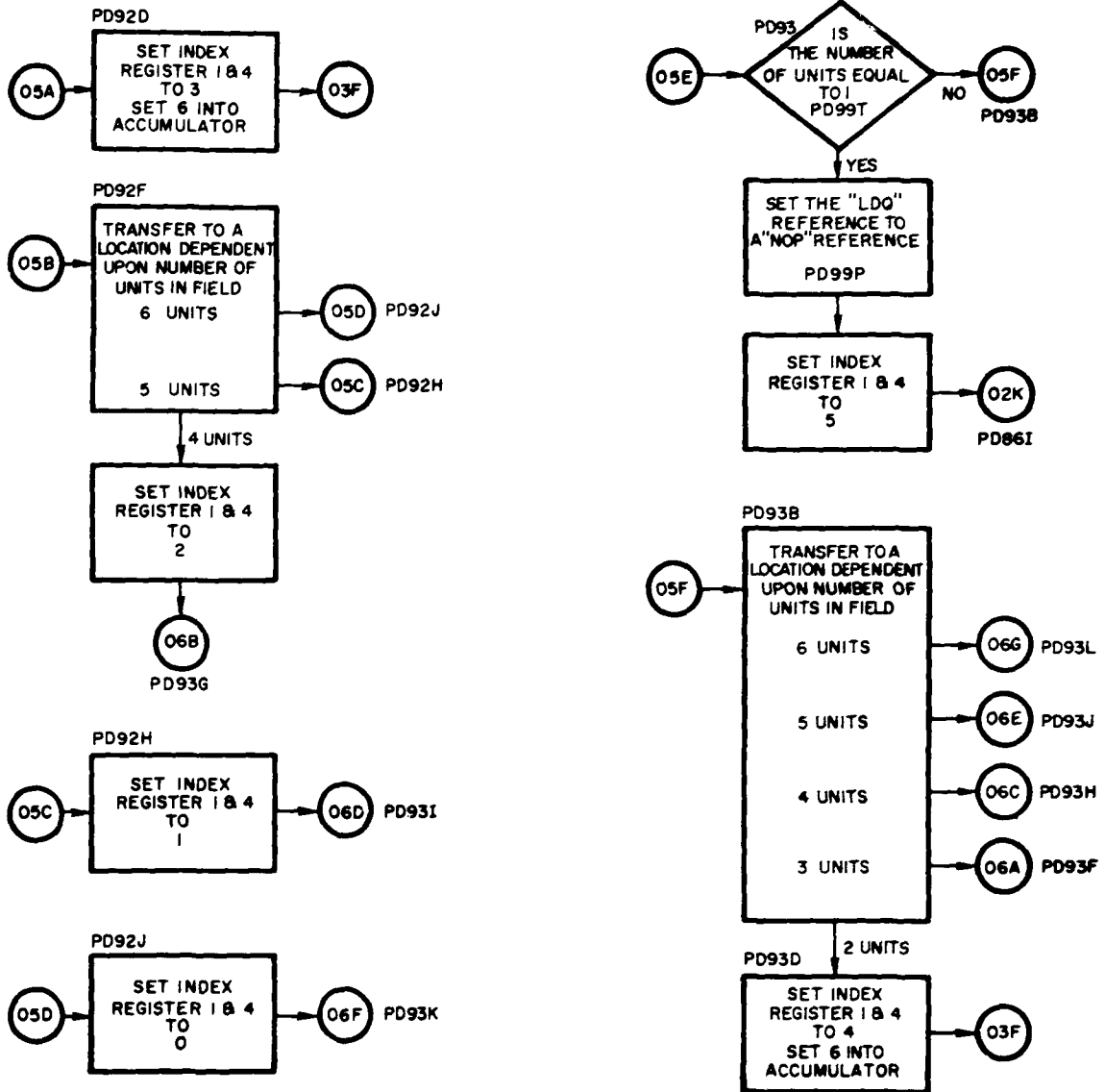


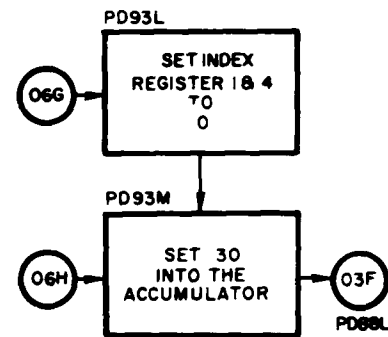
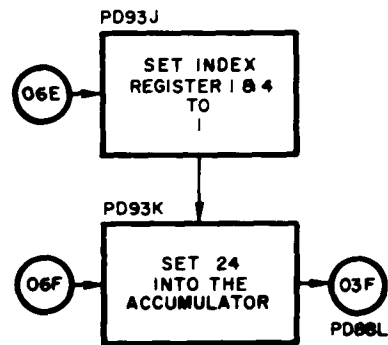
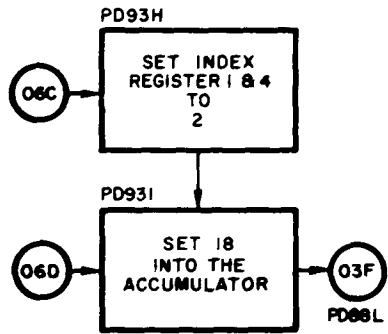
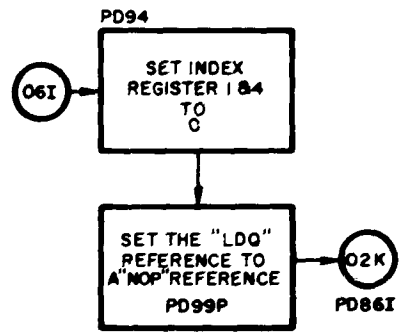
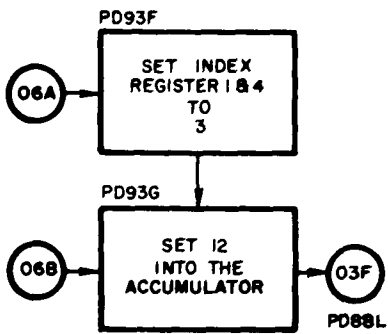


REGION PD80

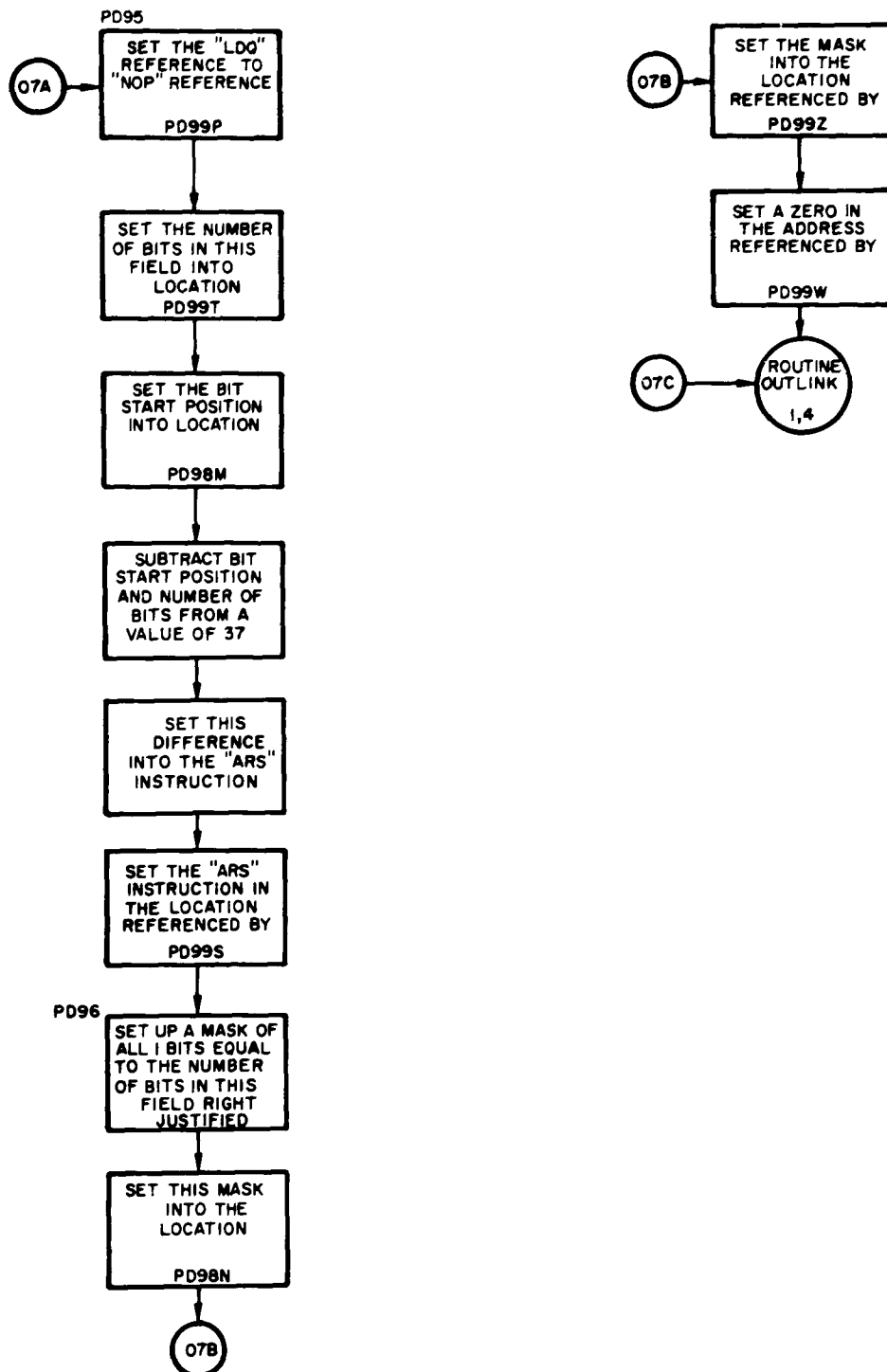


REGION PD80









### Time Merge Phase Tape and Record Layouts

The following layouts will show the tape and record configurations used in the time merge phase.

Figure III-F-6 shows the physical layout of the SECONDARY MASTER. It shows the label that is used with the input parameters and the 350-word input parameter block. Both the label and the input parameter block are ended with an end-of-record gap.

Following the input parameter block is the beginning of the activity-to-charge-number information. This area is headed by a two-record label. The first will indicate the type of information to follow, the date created, and the tape number if the tape is one of a series. The second label will contain the program name. After this label the data records will begin. These records are set in 600-word blocks for all blocks up to the last, which may be from 8 words to 600 words long. Each block will hold 75 logical 8-word records. These records are of two types, as described below.

- (a) Network Code Record Type, Which Contains a 1 as the First Character of the First Word (see Fig. III-F-7).

Following this type code are the network code, which is set up for a maximum of 6 characters, and the network description, which allows for 35 characters. This record type will precede all of the activity-to-charge-number data for that network. There will be only one of these cards for each network code that is used. The network description will be truncated by one character to fit into this record. The last word of this logical record contains the check sum generated by the writer routine.

- (b) Activity-to-Charge Number Record Type, Which Contains a 2 as the First Character of the First Word (see Fig. III-F-8).

Following this type code, the second word contains a predecessor number of 9 characters, a successor number of 9 characters, and a charge number of 18 characters. These Type 2 records will follow the network code record, and there can be any number of them within a network code, blocked into 600 word records. The last word of this logical record contains the check sum generated by the writer routine.

The end-of-tape conditions that are developed on this tape are shown in Fig. III-F-6. At the end of that SECONDARY MASTER there will always be two end-of-file marks indicating completion of this data.

The 35-word record of selected time information that is sent out to the activity-to-charge-number sort prior to the update phase is shown in Fig. III-F-8. This record will show the fields that are carried as well as how each field is set up. These fields include the following:

- (1) Charge Number (18H). The charge number can contain up to 18 Hollerith characters.
- (2) Activity Flow Time (Weeks  $\times$  10 at B35). The activity flow time is in weeks multiplied by 10 and is carried at a binary point of 35.
- (3) Expected Complete (DDMMYY). The expected complete time is carried as a calendar date by day, month, and year.
- (4)  $T_S$ - $T_A$  Flag (Indicator). The first character of this word will contain a blank if it represents  $T_S$  or an "A" if it represents  $T_A$ .

When this record is developed in core during the time merge phase this record is actually a 39-word record, with the first four words containing the network code, predecessor number, and successor number for comparing operations. The balance of the record is as shown in Fig. III-F-8.

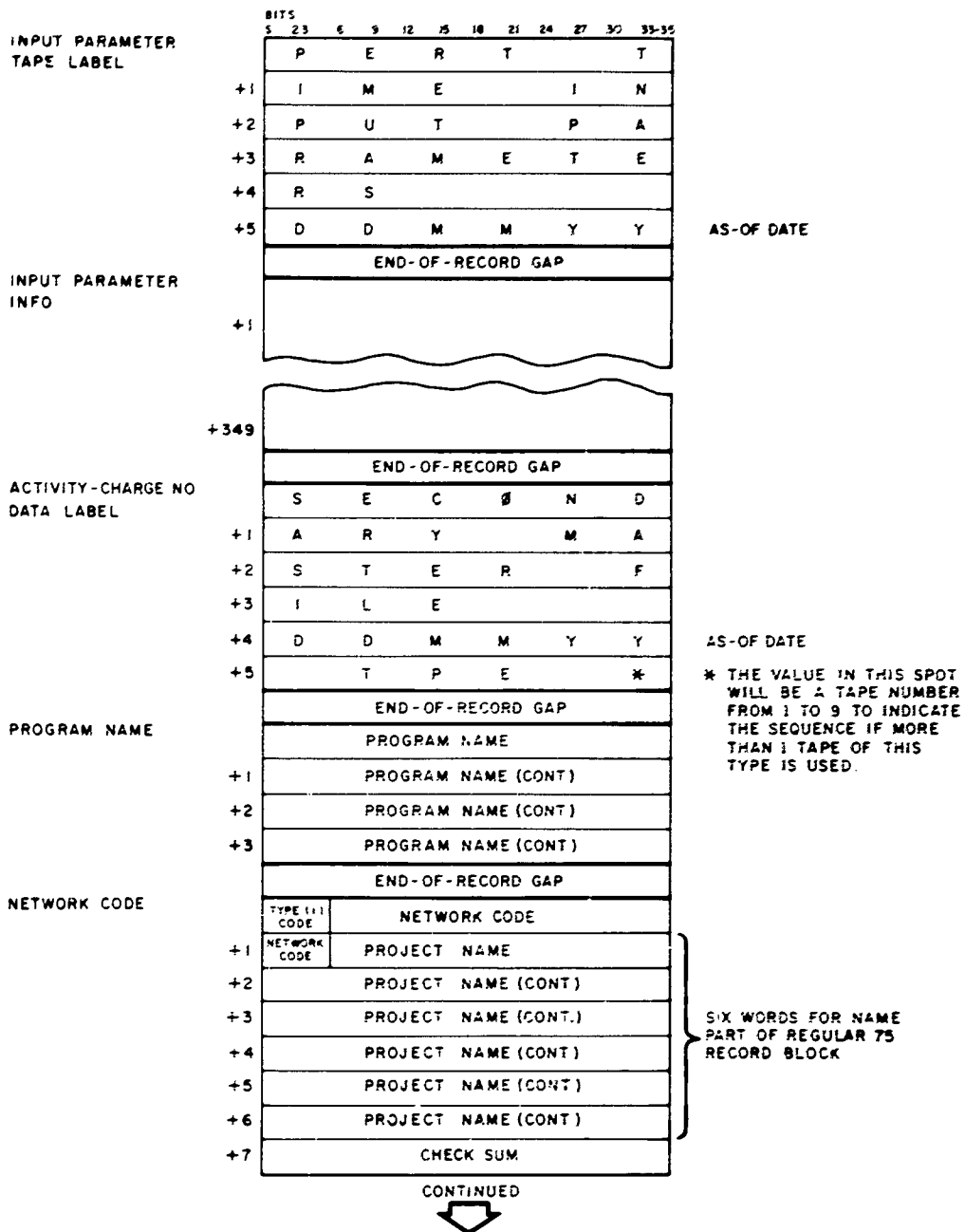


Fig III-F-6 Physical Layout of Secondary Master Tape

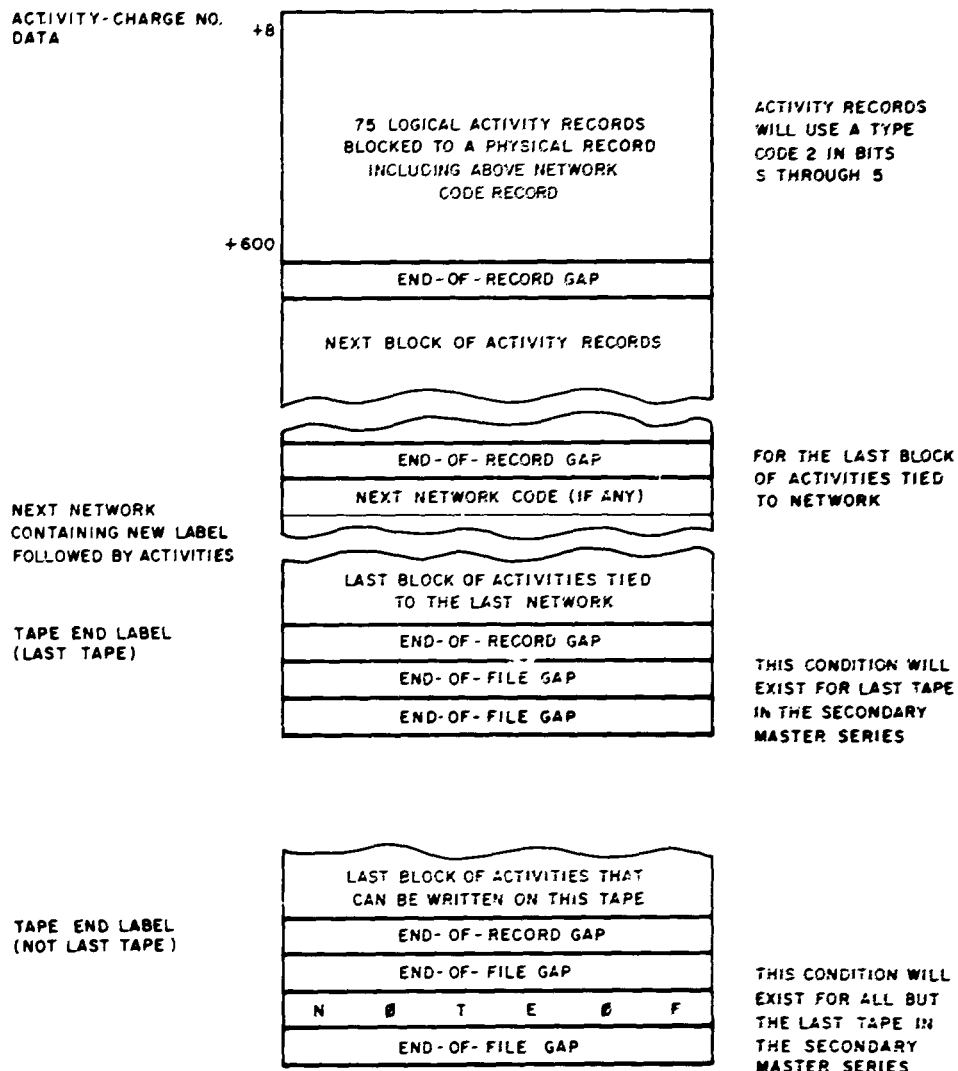
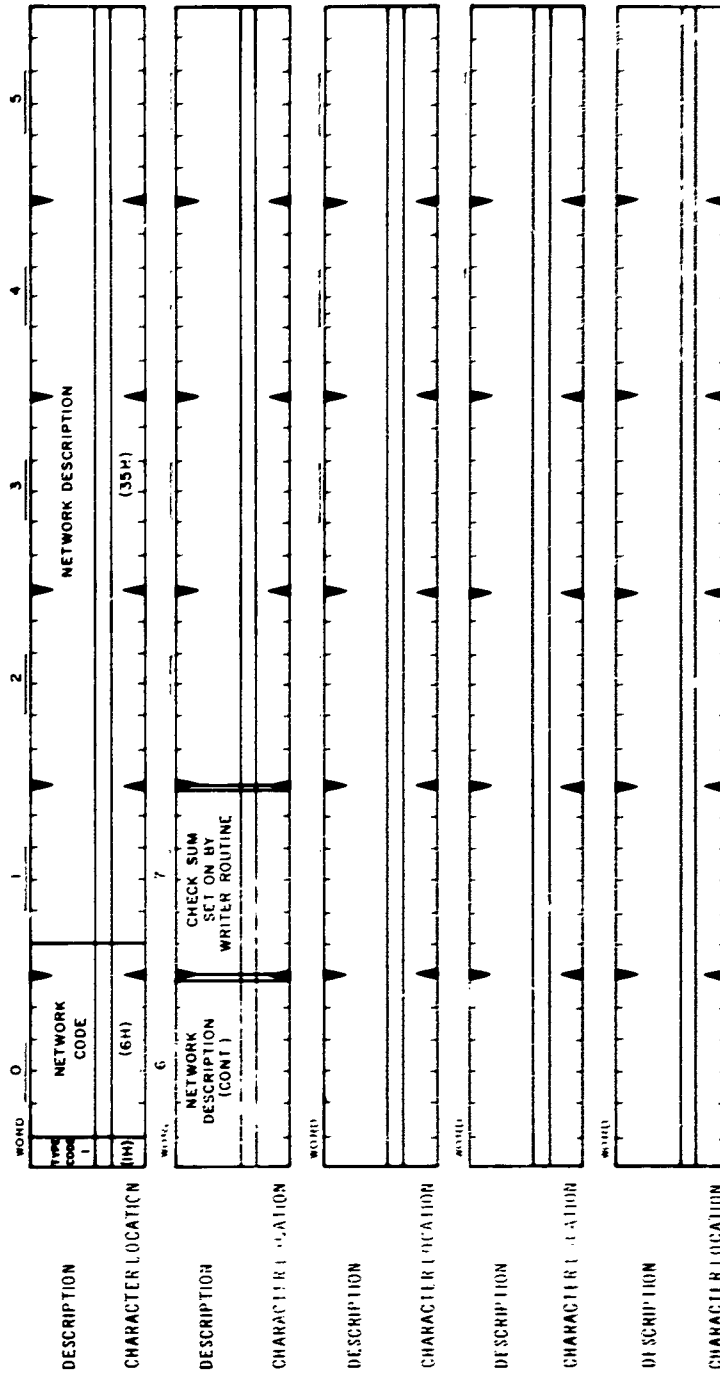


Fig. III-F-6 Physical Layout of Secondary Master Tape (Continued)



**Fig. III-F-7 Secondary Master Network Code Logical Record**

| DESCRIPTION        | WORD                        |                                          |                             |                        |   |
|--------------------|-----------------------------|------------------------------------------|-----------------------------|------------------------|---|
|                    | 0                           | 1                                        | 2                           | 3                      | 4 |
| CHARACTER LOCATION | TYPE<br>CODE<br>2           | PREDECESSOR<br>NUMBER<br>(9H)            | SUCCESSOR<br>NUMBER<br>(9H) | CHARGE NUMBER<br>(18H) |   |
| WORD 6             |                             |                                          |                             |                        |   |
| DESCRIPTION        | CHARGE<br>NUMBER<br>(CONT.) | CHECK SUM<br>SET ON BY<br>WRITER ROUTINE |                             |                        |   |
| CHARACTER LOCATION |                             |                                          |                             |                        |   |
| WORD 7             |                             |                                          |                             |                        |   |
| DESCRIPTION        |                             |                                          |                             |                        |   |
| CHARACTER LOCATION |                             |                                          |                             |                        |   |
| WORD 8             |                             |                                          |                             |                        |   |
| DESCRIPTION        |                             |                                          |                             |                        |   |
| CHARACTER LOCATION |                             |                                          |                             |                        |   |
| WORD 9             |                             |                                          |                             |                        |   |
| DESCRIPTION        |                             |                                          |                             |                        |   |
| CHARACTER LOCATION |                             |                                          |                             |                        |   |

\* ALWAYS PRECED - SUCCESSOR SEQUENCE

Fig. III-F-8 Secondary Master Data Logical Record

|                    |                                    |                               |                         |                                          |                                   |
|--------------------|------------------------------------|-------------------------------|-------------------------|------------------------------------------|-----------------------------------|
| DESCRIPTION        | CHARGE NUMBER                      |                               | PREDECESSOR NUMBER      |                                          | SUCCESSOR NUMBER                  |
| CHARACTER LOCATION | (10H)                              |                               | (9H)                    |                                          | (9H)                              |
| DESCRIPTION        | SUCCESSOR NUMBER (CONT)            | EXPECTED SCHED COMPLETE $S_E$ | EXPECTED COMPLETE $T_E$ | LATEST ALLOWABLE SCHED. COMPLETION $S_L$ | LATEST ALLOWABLE COMPLETION $T_L$ |
| CHARACTER LOCATION |                                    |                               |                         |                                          |                                   |
| DESCRIPTION        | SCHEDULED ACTIVITY FLOW TIME $T_s$ | ACTIVITY FLOW TIME $T_a$      | SLACK                   | ACTIVITY DESCRIPTION                     |                                   |
| CHARACTER LOCATION | WK * 10 #B35                       | WK * 10 #B35                  | WK * 10 #B35            | (54H)                                    |                                   |
| DESCRIPTION        | ACTIVITY DESCRIPTION (CONT.)       |                               |                         |                                          |                                   |
| CHARACTER LOCATION |                                    |                               |                         |                                          |                                   |
| DESCRIPTION        | NETWORK CODE                       | NETWORK DESCRIPTION           |                         |                                          |                                   |
| CHARACTER LOCATION | (6H)                               | (36H)                         |                         |                                          |                                   |

Fig. III-F-9 PERT Time Record Developed from User's Time Input and Secondary Master



| DESCRIPTION        | WORD 30                           |  |  |  | WORD 31                                                              |  |  |  | WORD 32                             |  |  |  | WORD 33 |  |  |  | WORD 34 |  |  |  |
|--------------------|-----------------------------------|--|--|--|----------------------------------------------------------------------|--|--|--|-------------------------------------|--|--|--|---------|--|--|--|---------|--|--|--|
|                    | NETWORK<br>DESCRIPTION<br>(CONT.) |  |  |  | T <sub>1</sub><br>T <sub>2</sub><br>T <sub>3</sub><br>T <sub>4</sub> |  |  |  | SCHEDULED<br>EXPECTED<br>START DATE |  |  |  | SPARE   |  |  |  |         |  |  |  |
| CHARACTER LOCATION |                                   |  |  |  | ⊕<br>A                                                               |  |  |  | D D M M Y Y                         |  |  |  |         |  |  |  |         |  |  |  |
| DESCRIPTION        |                                   |  |  |  |                                                                      |  |  |  |                                     |  |  |  |         |  |  |  |         |  |  |  |
| CHARACTER LOCATION |                                   |  |  |  |                                                                      |  |  |  |                                     |  |  |  |         |  |  |  |         |  |  |  |
| DESCRIPTION        |                                   |  |  |  |                                                                      |  |  |  |                                     |  |  |  |         |  |  |  |         |  |  |  |
| CHARACTER LOCATION |                                   |  |  |  |                                                                      |  |  |  |                                     |  |  |  |         |  |  |  |         |  |  |  |
| DESCRIPTION        |                                   |  |  |  |                                                                      |  |  |  |                                     |  |  |  |         |  |  |  |         |  |  |  |
| CHARACTER LOCATION |                                   |  |  |  |                                                                      |  |  |  |                                     |  |  |  |         |  |  |  |         |  |  |  |
| DESCRIPTION        |                                   |  |  |  |                                                                      |  |  |  |                                     |  |  |  |         |  |  |  |         |  |  |  |
| CHARACTER LOCATION |                                   |  |  |  |                                                                      |  |  |  |                                     |  |  |  |         |  |  |  |         |  |  |  |
| DESCRIPTION        |                                   |  |  |  |                                                                      |  |  |  |                                     |  |  |  |         |  |  |  |         |  |  |  |
| CHARACTER LOCATION |                                   |  |  |  |                                                                      |  |  |  |                                     |  |  |  |         |  |  |  |         |  |  |  |

\* IN CORE DURING TIME MERGE - A 39 WORD RECORD IS SET UP -  
THE 1ST 4 WORDS BEING NETWORK CODE - PREDECESSOR NO  
AND SUCCESSOR NO - THE BALANCE IS AS SHOWN

Fig. III-F-9 PERT Time Record Developed from User's Time Input  
and Secondary Master (Continued)

### III-G

### PERT COST UPDATE PHASE

#### Cost Update General Description

The update phase can be considered to consist of two principal stages: (1) the creation or updating of the rate and skill tables and the initialization of the Update phase, and (2) the creation or updating of the master file and the transmission of data to the reporting phase. Figure III-G-1 diagrams the computer logic for this phase.

At the start of this phase an initialization procedure determines which sort tapes are now available for use and which indicators should be set up for this phase. These indicators will reflect the options and control indications from the control cards. The first record of the SORTED TIME TAPE, OLD PERT COST MASTER, and SORTED DATA TAPE will each be read into their respective buffers. If the program is being run under a "file establish" condition, an end-of-file indicator is set for the OLD PERT COST MASTER and no data will be expected from this tape. If the program is being run under a "no time tape" condition, an end-of-file indicator is set for the USERS TIME TAPE and time information will not be expected. If there have been no Type 7 cards read into the system, an end-of-file indicator is set for the SORTED DATA TAPE.

The rate table and skill table are developed at file establishment time and are carried on the PERT COST MASTER TAPE. These records are read in every cycle and can be updated by 4, 5, and 6 card inputs from the SORTED DATA TAPE.

During the master file creation and update phase a comparison of the charge (or summary) numbers is made between the OLD PERT COST MASTER FILE and the SORTED DATA TAPE (where both tapes are sorted in charge number order). Depending on the outcome of this comparison the program will transfer control to one of three routines:

- (1) OLD MASTER charge number is less than the Input Tape (SORTED DATA TAPE) charge number

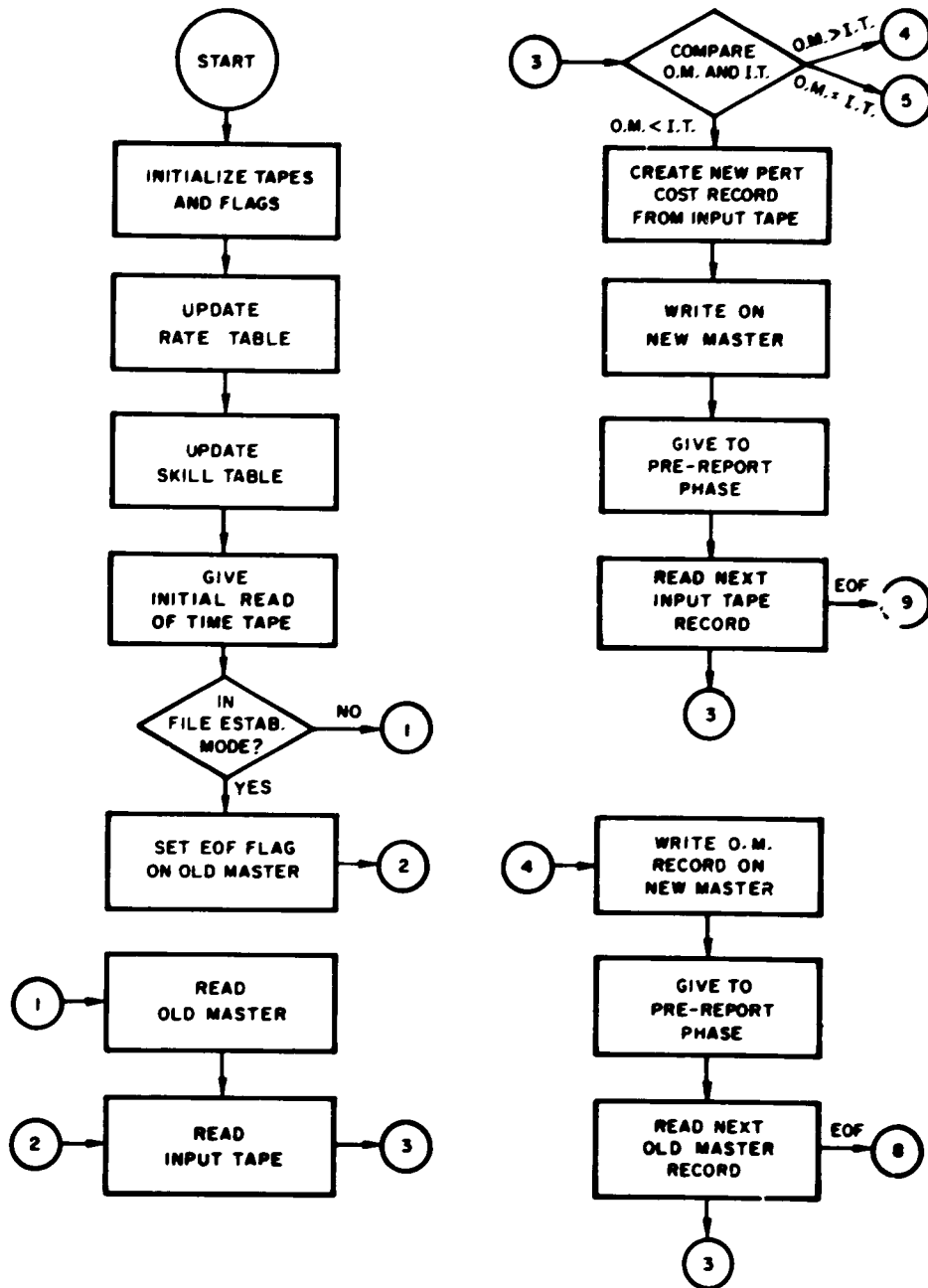


Fig. III-G-1 Flow Diagram of Update Phase

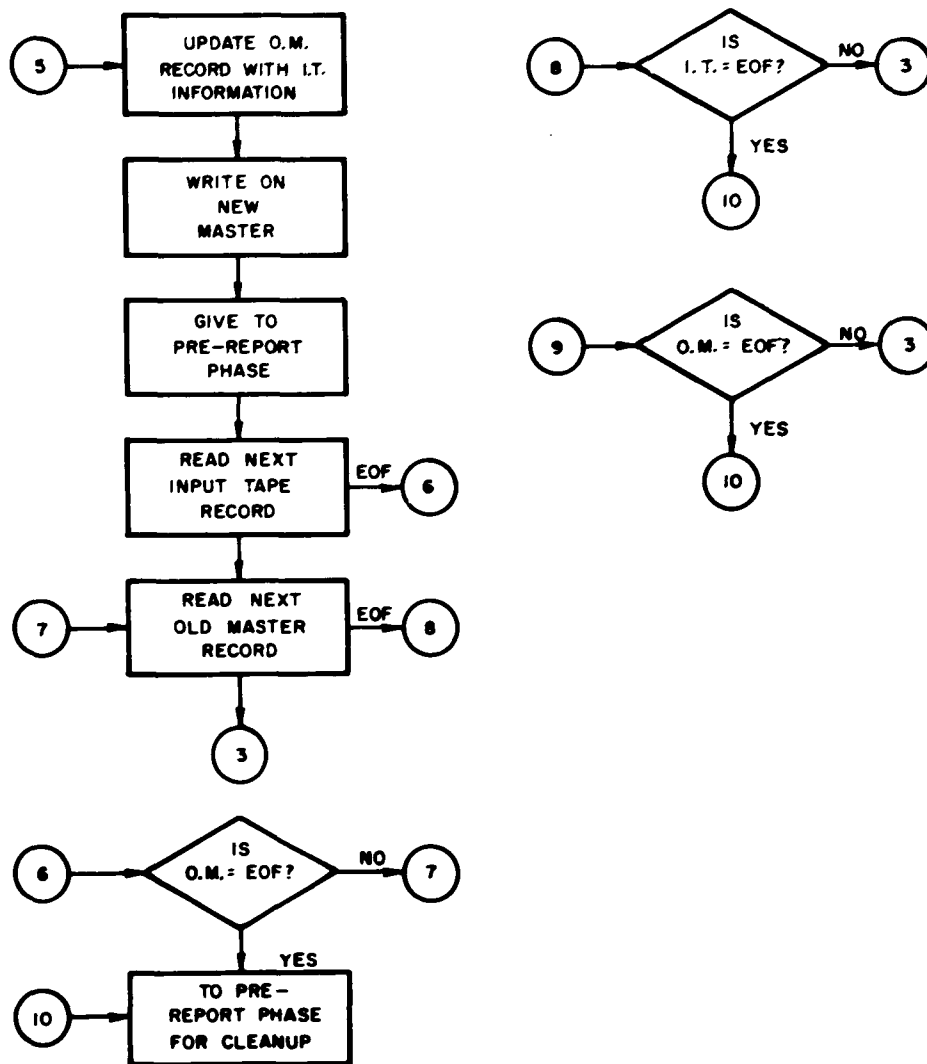


Fig. III-G-1. Flow Diagram of Update Phase (Continued)

- (2) OLD MASTER charge number is greater than Input Tape charge number
- (3) OLD MASTER charge number is equal to the Input Tape charge number

When the end-of-file indicator is set for either of these tapes, the charge number from that tape is set to all octal sevens (the greatest number possible).

For the condition when the OLD PERT COST MASTER TAPE is less than the input, only the information from the OLD MASTER is utilized and the Input Tape information is ignored. In this case the following operations are performed on the three types of information records.

- (a) Type 1 (Charge Number information)  
The Type 1 record from the OLD MASTER is placed in a storage block (UCHG). The SORTED TIME TAPE is searched for all activities related to the charge number in UCHG. The activity information is summarized and placed into the pseudo time storage block (UTIME). If no activities are related to the specified charge numbers, UTIME is cleared. The UCHG block is now written on the NEW PERT COST MASTER as a new Type 1 record.
- (b) Type 2 (Performing Organization information)  
The Type 2 record is placed in a storage block (UPUN) and then written on the NEW MASTER.
- (c) Type 3 (Resource Code information)  
The Type 3 information is placed in a storage block (QRES2), transferred to storage block (QRES1), and written on the NEW MASTER from QRES1. The data in QRES2 is extended through use of the rate table prior to being placed in QRES1. The information in UCHG, UPUN, QRES2, and UTIME is given to the Pre-reporting Phase for processing.

If a Type 1 record is immediately followed by a Type 3 record, or a new charge number is found to be less than the previous charge number, a sequence error message is printed on-line and the computer will halt.

For the condition when the OLD PERT COST MASTER is greater than the input, only the information from the Input Tape is used and the OLD

MASTER is ignored. This condition is essentially the establishment of a new charge number in the master file. The types of input cards used to establish a charge number will be as follows:

(a) Type 7-0, 7-1, 7-2 Cards

The Type 7-0 card must in this condition be entered with a transaction code of "A." The 7-0 card information is transferred into the UCHG block and then updated with the information from the 7-1 and 7-2 cards. The information in the UCHG block (after the search of the Time Tape is performed) is then written on the NEW PERT COST MASTER TAPE as a Type 1 record. If the transaction code of the 7-0 card is not an "A," an exception message will be written on the SYSTEM ERROR TAPE, followed by a display of the 7-0 card in error. The program will then read the next card from the Input Tape and continue normal processing.

If any Type 7 cards are entered for a certain charge number and the 7-0 card for this number is not available or was rejected due to an error in the card, these cards will be rejected and an exception message will be printed on the SYSTEM ERROR TAPE followed by a display of the card.

(b) Type 7-3, 7-4, 7-5 Cards

The Type 7-3, 7-4, and 7-5 cards are used in creating a Type 2 and a Type 3 record for the NEW PERT COST MASTER TAPE. The Performing Organization information will be placed in UPUN and then written out on the NEW MASTER TAPE. The 7-3 card will set the actual cost information into the correct months of the Resource Code block QRES2. The 7-4 and 7-5 cards will place the cost estimates and budgets into the correct months (with respect to the charge number start date) of the QRES2 block. The cost information is packed down and placed into the QRES1 block, from where it is written as a Type 3 record on the NEW MASTER TAPE. If the transaction code of the 7-4 or 7-5 card is not an "A," an exception message will be placed in the Error Report followed by an image of the incorrect card.

For the condition when the OLD PERT COST MASTER TAPE is equal to the SORTED DATA TAPE the records from the OLD MASTER are read into the appropriate storage blocks, are updated by the Type 7 cards from the Input

Tape, and then are written as Type 1, 2, or 3 records on the NEW MASTER TAPE. If a card with an "A" transaction code is received, the card will be rejected and an exception message will be printed on the Error Report. If a Type 7-0 card is input with a "D" transaction code, a "deletion" indicator is set. All charge number, performing organization, and resource code records which do not contain actual cost data will be deleted. If a resource code record contains actual costs, only the cost estimate and budget data will be deleted and the charge number, performing organization, and resource code records will be written on the NEW MASTER. If a 7-4 or 7-5 card is input with a "D" transaction code, the performing organization and resource code records will be deleted unless actual data appears in the record. If actual data appears and is removed from the record (using a 7-3 card), the record will be deleted if the "deletion" indicator is set. If actual data is contained in the record to be deleted, an exception message is placed on the error report.

If a 7-4 or 7-5 card containing a "C" transaction code is input and the "delete" indicator is set, an exception message will be set on the SYSTEM ERROR TAPE followed by a display of the card in error.

When the updating is completed, the NEW PERT COST MASTER will be rewound and unloaded. At the end of the update phase a message indicating the number of errors encountered during the processing will be displayed on the on-line printer. This message will take one of the following forms:

XXXX ERRORS DETERMINED  
IF RUN IS TO BE CONTINUED EVEN THOUGH  
ERRORS INDICATED HIT START  
NO ERRORS DETERMINED

If the first message is printed out, the program will stop. If these errors are to be ignored, the start button at the console is hit and they are bypassed. The program will then go into the output preprocessing sort and then into the output phase. Where no errors are indicated the program will go into the sort and output phase automatically.

### Cost Update Rate Table

The rate table used with the PERT Cost system utilizes a very basic approach. It will contain rate information to be applied against the unit value to arrive at direct dollar totals or a rate to be applied against the direct dollars to arrive at total dollars. This table will be used with both estimates and budget values (but not actual values) tied to the performing-unit/resource-code combinations or to just the resource codes. The program will actually make two passes in searching through the rate table. The first pass will be to check whether the performing-unit/resource-code combination can be located in the rate table. If it cannot be found, a second pass is made against only the resource code. If the resource code still cannot be found, it is not in the table.

This table can be updated by means of the Type 4 input from the SORTED DATA TAPE. These input cards can change, add, or delete information in this table. On file establishment this table is developed in core at location RTBAR and, after completing the read-in of all Type 4 cards, is set out on the NEW PERT COST MASTER. On the cyclic updating runs, this table is read in from the OLD PERT COST MASTER and set into core at RTBAR. It is then updated, if any Type 4 cards are present, and then set out on the NEW PERT COST MASTER. The rate table will remain in core during the entire update phase.

The rate table will use the "next available slot" approach, which automatically packs the information and allows for fast retrieval. This approach will be discussed **starting on Page III-G-8.**

The unit rate information carried in this table is of a variable scaling in that any value from ".xxxxxx" to "xxxxxx." can be used. The indicator for the scaling factor is contained in bits 18 - 20 of the first word of a slot, as shown in Fig. III-G-7. The overhead rate is of fixed scaling in the form of "x.xxx" and no scaling factor is needed.

The rate table is broken down into two separate tables or sections. One is 800 words that contain information in 3-word sets. This information is



the performing unit (if any), resource code, and link to the first set of rate data in the second section of the table. The second section of the table is of 3203 words and will contain the rate information. These slots will indicate the year, the quarter (if any), the scaling factor (if any), the link to the next slot that contains information for this performing-unit/resource-code combination, and the overhead and unit rates. It is possible to have only an overhead or only a unit rate in any one slot, or both can be present.

#### Rate Table Next-Available-Slot Approach

It is believed that a brief description of the next-available-slot approach will help the reader understand the operation of this system. The following are some terms that will be used in the discussion of this method:

- (a) Bucket - A bucket refers to a group or category that the information involved will be split into. An example is the performing-unit/resource-code or resource code combinations in section 1 of the rate table (see Fig. III-G-7).
- (b) Downlink - The downlink portion of the word refers to the channel of the next slot that is part of the same bucket.
- (c) Empty Control - Empty control is basically the bucket for all channels that are not in use.

The way the next-available-slot method works is that a group of buckets are set up, dependent upon input to the system. For discussion purposes, we will set up two locations called Bucket A and Bucket B, and all our information will be split into these categories. We also assume there is a maximum of ten slots in these categories at any one time.

At the start, the Empty Control will contain 10 words, each containing the downlink to the previous channel as shown conceptually in Fig. III-G-2. A bucket downlink of zero indicates this is the last link of the bucket. Thus, at this time, there are no links connected to Bucket A or B.

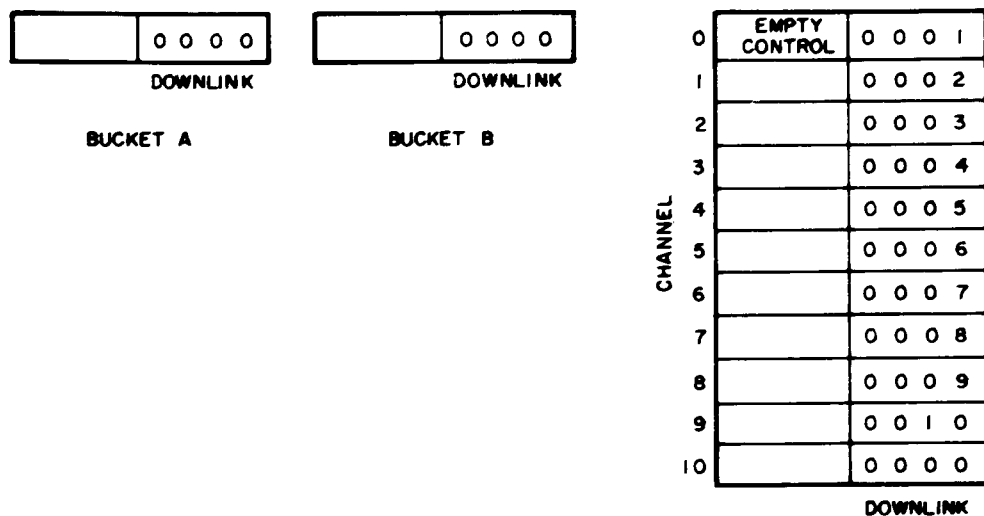


Fig. III-G-2 Start of Next-Available-Slot Method

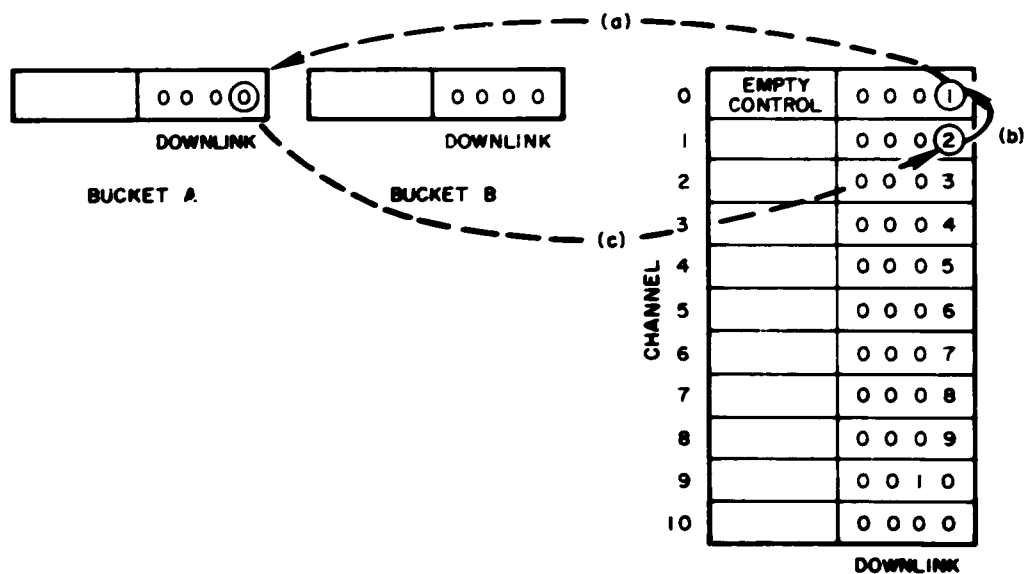


Fig. III-G-3 Sequence of Steps in Adding Information to Rate Table by Next-Available-Slot Method

As information comes into the system to be placed in the proper bucket, the following will result:

- (a) The downlink of the Empty Control will give the channel number of the next empty channel to use, which will be placed in the downlink of the proper bucket.
- (b) The downlink of the next empty channel replaces the previous downlink in Empty Control so as to set up the second empty channel for the next request.
- (c) The downlink that had been in the bucket replaces the downlink in the empty channel.

These steps in adding information are indicated by arrows in Fig. III-G-3, under the assumption the information is to be added to Bucket A.

The above process is illustrated in Fig. III-G-4, using the simplified Bucket A and Bucket B example previously described. Suppose information A-1 and B-1 are to be added to the table. Empty Control will tell us that Channel 1 is the next empty channel. The information is entered in Channel 1, and the number 1 replaces zero as the Bucket A downlink, indicating that the last information in Category A is to be found in Channel 1. The zero

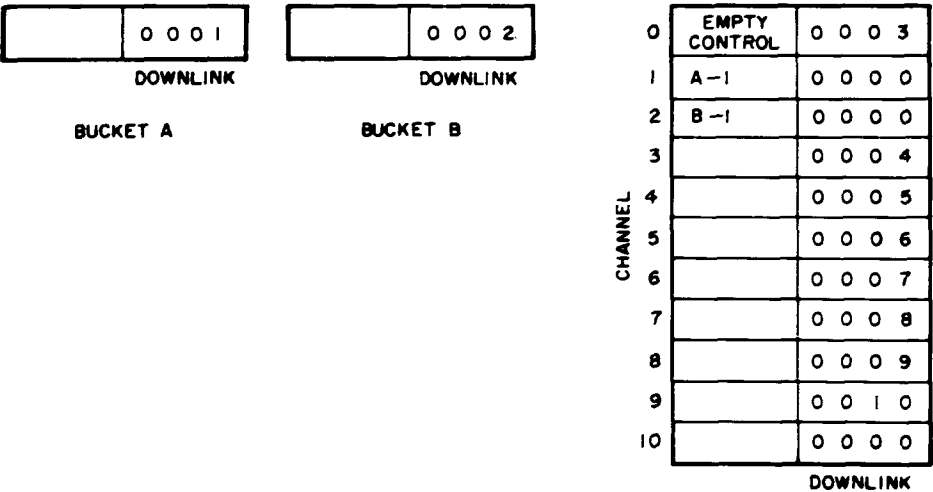
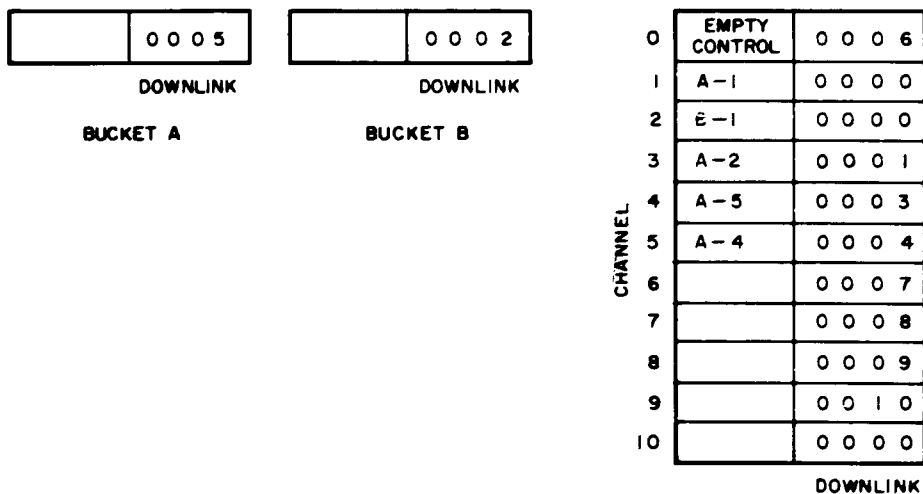


Fig. III-G-4     Adding A-1 and B-1 to Rate Table

Under the next-available-slot system, as some information becomes outdated it will have to be removed from the bucket in reverse manner to the addition process shown in Fig. III-G-3.

- (a) The table is searched for the duplicate information control bit, such as A-1, A-4, etc. This is located by examining first the channel containing the last information added to this bucket category, as indicated by the appropriate bucket downlink. If the information in this channel does not match the control bit, the next channel up the downlink chain is examined, etc., until the duplicate information control bit is found. At this point, the channel just previously examined will have its downlink replaced by the



**Fig. III-G-5. Adding A-2, A-5, and A-4, in Stated Order, to Rate Table**

downlink of the channel being deleted. If the channel being removed is the last piece of information added to this bucket (i. e. , the channel indicated by the bucket downlink), the downlink of the deleted channel replaces the downlink in the bucket.

- (b) The downlink in the Empty Control will then replace the downlink in the deleted channel.
- (c) The deleted (empty) channel becomes the value shown in the Empty Control downlink; that is, it becomes the next available channel.

Continuing the example previously set up, assume A-5 and B-1 are to be deleted. Searching through the table, we find A-5 in Channel 4, with Channel 5 being the next channel in the Bucket A downlink. The downlink from Channel 4 will then replace the downlink in Channel 5, thereby deleting A-5 from the bucket. The now-empty Channel 4 is entered as the downlink to Empty Control, while the previous Empty Control downlink is assigned to Channel 4. The same procedure is followed in deleting B-1 except that the downlink of the deleted B-1 becomes the Bucket B downlink. The result is shown in Fig. III-G-6.

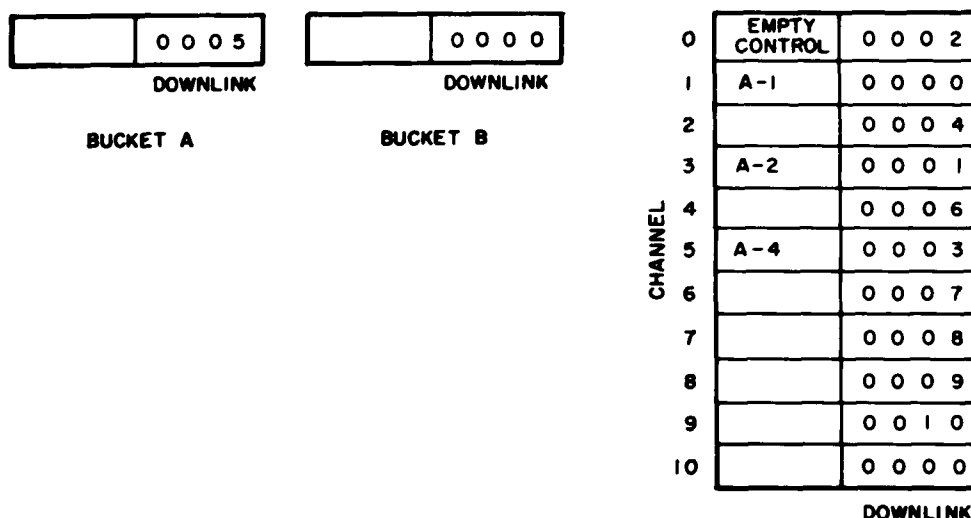


Fig. III-G-6. Deleting A-5 and B-1 from Rate Table

### Rate Table Error Messages

In developing and updating the RTBAR table from the Type 4 input cards, the following error or exception messages can be produced, depending on the type of error. All of these errors will be set out on the SYSTEM ERROR TAPE.

- (a) AN ERROR EXISTS ON THE FOLLOWING CARD  
YEAR TO BE CHANGED NOT IN CURRENT FILE  
XX - 80 characters of input card - XX

This message will be set out when a Type 4 input is attempting to change a rate for a year or a year-and-a-quarter that does not exist. The third line of this message will be an 80-character representation of the input card that caused this error. This representation will also follow all of the messages below.

- (b) AN ERROR EXISTS ON THE FOLLOWING CARD  
YEAR TO BE DELETED NOT IN CURRENT FILE

This message will be set out when a Type 4 input is attempting to delete a rate for a year or a year-and-a-quarter that does not exist.

- (c) 15 RESOURCE CODE DELETIONS MAX. FROM RATE  
TABLE PER RUN. FOLLOWING CARD NOT ACCEPTED

More than 15 performing unit/resource code or resource code items have been deleted, which is the maximum size of the delete table. The card shown is ignored.

- (d) AN ERROR EXISTS ON THE FOLLOWING CARD  
PERF. UNIT AND RES. CODE NOT IN CURRENT FILE

This message will be set out when a Type 4 input is attempting to update the rate for a nonexistent performing unit/resource code combination or resource code.

- (e) RATE TABLE FULL. FOLLOWING CARD NOT  
ACCEPTED

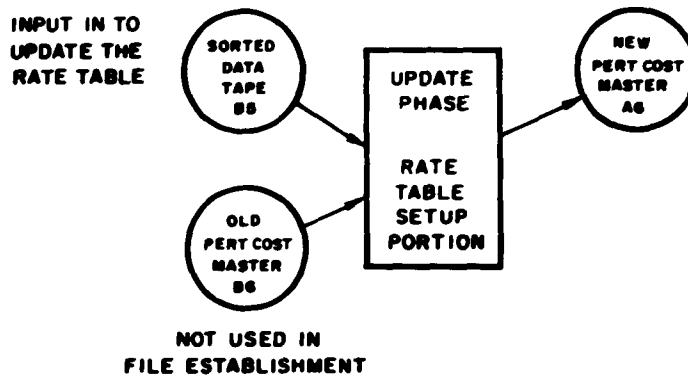
The table has reached its maximum of 266 performing unit/resource code or resource code combinations, and this card is not being processed or it has reached a maximum of 1601 individual year or year-and-a-quarter slots.

- (f) AN ERROR EXISTS ON THE FOLLOWING CARD  
PERF. UNIT AND RES. CODE EXIST IN CURRENT  
FILE WITH DUPLICATE YEAR AND QUARTER

This message will be set out when a Type 4 input is attempting to add a rate for a year or a year-and-a-quarter that does exist. The program will then continue checking other fields on this card that contain other years and quarters for processing. It is possible to have up to four of these messages pertaining to the same card.

#### Rate Table Tape Operations

After the completion of the activity-to-charge-number sort, the tape on A6 will contain only the NEW SECONDARY MASTER TAPE. This tape will not be rewound, due to the fact that the NEW PERT COST MASTER will be set on as a second file. The first item set onto the NEW PERT COST MASTER TAPE will be the rate table. If the system is in a file establishment mode, the Type 4 inputs are set into the table at RTBAR, and this table is set out onto the NEW PERT COST MASTER. If this system is to be run without any rates, a rate table of 4003 words is still set out on tape but it will contain no rate information. If this system is not in a file establishment



mode, the rate table is read in from the OLD PERT COST MASTER into its core location at RTBAR. It is then updated, if any Type 4 inputs are present, and written out on the NEW PERT COST MASTER. The above sketch shows the tapes that can be used during this portion of the update phase.

#### Rate Table Restrictions and Operations

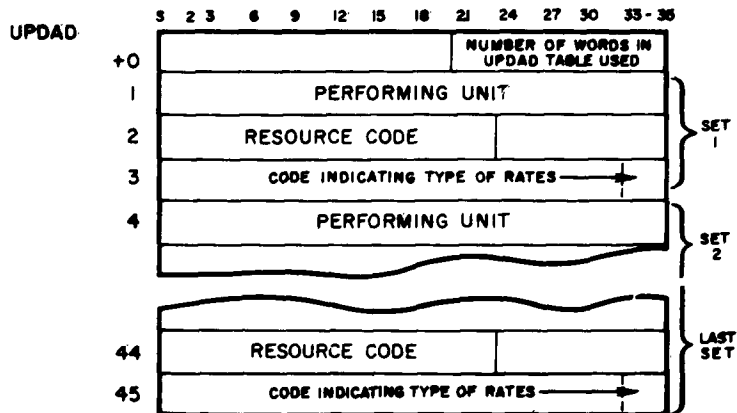
The following rate table restrictions and program operation approaches were used in developing this table.

- (a) A maximum of 266 performing unit/resource code or resource code combinations can be set up in this rate table. This maximum is developed by dividing the block allocated to this area, which is 799, by the size of each set of data, which is 3.
- (b) It will provide 1601 individual year-and-quarter or year slots that can be tied to any number of performing unit/resource code slots from 1 to 266. This maximum is developed by dividing the block allocated to this area, which is 3202, by the size of each year-slot (which is 2).
- (c) A maximum of 15 performing unit/resource code or resource code combinations can be deleted from the rate table for any processing run. This maximum is developed by dividing the block allocation, which is 45, by the size of a delete set (3). The information carried in this block contains the performing unit, the resource code, and a code indicating the type of rates being deleted. This code will take the following form:
  - 1 - Only unit rate carried by item deleted
  - 2 - Only overhead rate carried by item deleted
  - 3 - Both unit and overhead rate carried by the item deleted.

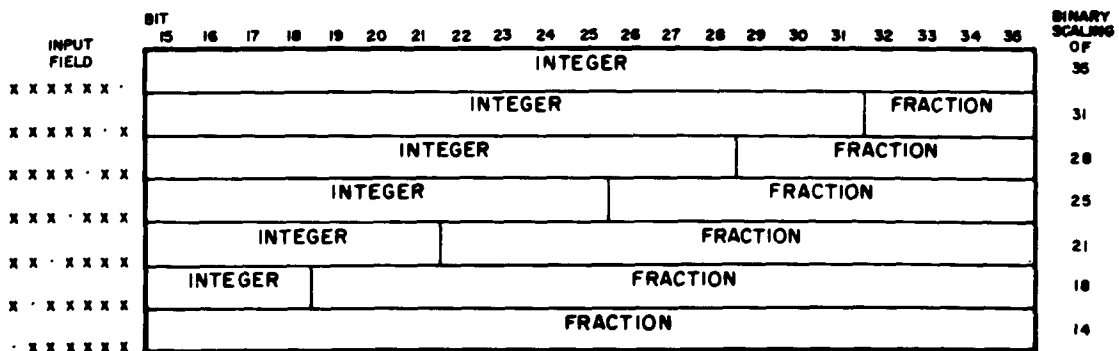
The purpose of this delete table located at UPDAD is to be able to remove any rate extensions that were developed in a prior run. The format of this table is shown on

Page III-G-16.

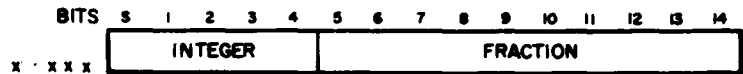




- (d) The floating decimal approach operates in the following manner. The unit rates will have a floating decimal point allowing for a value in the range of .000001 to 999999. This value is converted to a binary number and is carried in a 21-bit portion of the second word of a slot of the rate table (See Fig. III-G-7). These fields will have a fraction portion that varies according to the location of the decimal point. The decimal indicator will carry the number of decimal characters from 0 to 6. For example, 12345.6 will be a 1, while 12.3456 will be a 4. The scaling that will be used in the unit rate field will be as follows:

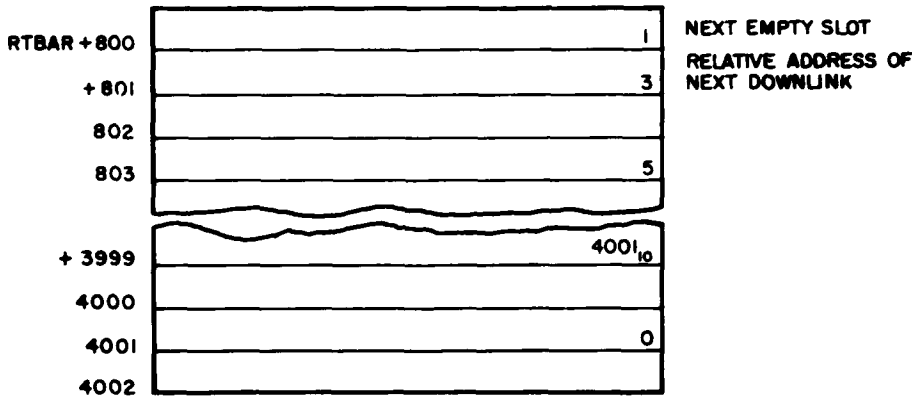


The format of the overhead rate will be fixed for all slots and will take on the following form



### Rate Table Layouts

The layout shown in Fig. III-G-7 indicates the RTBAR table as it is carried in core. Initially, the second section of this table is preset with the relative address of its next available slot and will appear as follows



The values in the address of this table will represent relative locations of the next value tied to that word and are carried in binary. The last slot tied to the empty slot indicator will contain a zero.

From this initial setup, the rate table is built up by setting in the values developed from the Type 4 cards, using the next-available-slot approach. This table, as shown in Fig. III-G-7, is divided into two sections. The first section comprises the performing unit-resource code or resource code combination with a maximum of 266. The downlink tied to this combination refers to the relative address of the first slot that contains rate information for this item.

RTBAR  
3 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35

|        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| WORD 0 | FIRST PERFORMING UNIT NUMBER  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | NUMBER OF WORDS *                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| +1     | FIRST RESOURCE CODE NUMBER    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | LOCATION OF FIRST DOWNLINK TIED TO THE ABOVE PERFORMING UNIT - RESOURCE CODE COMBINATION |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| +2     | SECOND PERFORMING UNIT NUMBER |  |  |  |  |  |  |  |  |  |  |  |  |  |  | LOCATION OF FIRST DOWNLINK TIED TO THE ABOVE PERFORMING UNIT - RESOURCE CODE COMBINATION |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| +3     | SECOND RESOURCE CODE NUMBER   |  |  |  |  |  |  |  |  |  |  |  |  |  |  | LOCATION OF FIRST DOWNLINK TIED TO THE ABOVE PERFORMING UNIT - RESOURCE CODE COMBINATION |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| +4     | NEXT PERFORMING UNIT NUMBER   |  |  |  |  |  |  |  |  |  |  |  |  |  |  | LOCATION OF FIRST DOWNLINK TIED TO THE ABOVE PERFORMING UNIT - RESOURCE CODE COMBINATION |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| +5     | NEXT RESOURCE CODE NUMBER     |  |  |  |  |  |  |  |  |  |  |  |  |  |  | LOCATION OF FIRST DOWNLINK TIED TO THE ABOVE PERFORMING UNIT - RESOURCE CODE COMBINATION |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| +6     | OVERHEAD RATE                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | UNIT - RESOURCE CODE COMBINATION                                                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| +7     | OVERHEAD RATE                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | UNIT - RESOURCE CODE COMBINATION                                                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| +8     | OVERHEAD RATE                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | UNIT - RESOURCE CODE COMBINATION                                                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

SECTION 1 \*\*  
+798  
+800  
+801  
+802  
+803  
+804  
+805  
+4001  
+4002

|                                                                                          |  |  |  |  |                                                                                |  |  |  |  |               |  |  |  |  |
|------------------------------------------------------------------------------------------|--|--|--|--|--------------------------------------------------------------------------------|--|--|--|--|---------------|--|--|--|--|
| LOCATION OF FIRST DOWNLINK TIED TO THE ABOVE PERFORMING UNIT - RESOURCE CODE COMBINATION |  |  |  |  |                                                                                |  |  |  |  |               |  |  |  |  |
| LOCATION OF NEXT EMPTY SET OF SLOTS IN SECTION 2 OF THIS TABLE                           |  |  |  |  |                                                                                |  |  |  |  |               |  |  |  |  |
| YEAR                                                                                     |  |  |  |  | QUARTER                                                                        |  |  |  |  | OVERHEAD RATE |  |  |  |  |
| DECIMAL IND. IN UNIT RATE                                                                |  |  |  |  | LINK TO ANOTHER YEAR AND QUARTER FOR THIS SAME PERFORMING UNIT - RESOURCE CODE |  |  |  |  | UNIT RATE     |  |  |  |  |
| YEAR                                                                                     |  |  |  |  | QUARTER                                                                        |  |  |  |  | OVERHEAD RATE |  |  |  |  |
| DECIMAL IND. IN UNIT RATE                                                                |  |  |  |  | LINK TO ANOTHER YEAR AND QUARTER FOR THIS SAME PERFORMING UNIT - RESOURCE CODE |  |  |  |  | UNIT RATE     |  |  |  |  |
| YEAR                                                                                     |  |  |  |  | QUARTER                                                                        |  |  |  |  | OVERHEAD RATE |  |  |  |  |
| DECIMAL IND. IN UNIT RATE                                                                |  |  |  |  | LINK TO ANOTHER YEAR AND QUARTER FOR THIS SAME PERFORMING UNIT - RESOURCE CODE |  |  |  |  | UNIT RATE     |  |  |  |  |
| YEAR                                                                                     |  |  |  |  | QUARTER                                                                        |  |  |  |  | OVERHEAD RATE |  |  |  |  |
| DECIMAL IND. IN UNIT RATE                                                                |  |  |  |  | LINK TO ANOTHER YEAR AND QUARTER FOR THIS SAME PERFORMING UNIT - RESOURCE CODE |  |  |  |  | UNIT RATE     |  |  |  |  |

\* NUMBER OF WORDS ASSOCIATED WITH A PERFORMING UNIT - RESOURCE CODE COMBINATION IN THIS SET OF SLOTS. SECTION 1 IS SORTED BY PERFORMING UNIT - RESOURCE CODE

\*\* SECTION 1 IS SORTED BY PERFORMING UNIT - RESOURCE CODE

\*\*\* A VALUE OF ZERO IN THIS FIELD INDICATES THIS IS THE LAST DOWNLINK OF A SET

\*\*\*\* THIS VALUE WILL INDICATE THE NUMBER OF DECIMAL DIGITS IN THE UNIT RATE

Fig. III-G-7. Rate Table Record

III-G-18

The second section comprises the rate information as related to a particular year or year-and-quarter. If there is only one year or year-and-quarter tied to an item in Section 1, the downlink is set to zero to indicate this. If there are more than one year or year-and-quarter tied to an item in Section 1, the downlink is set to the relative location of the next slot tied to this item. This linking will go on until the last slot tied to this item is found, and this slot will contain a zero in the downlink. The year-and-quarter in the first word of a Section 2 slot will be set up in binary.

At RTBAR +800 the relative location of the next available slot to be used can be found. When this number is zero it indicates there are no more slots available.

#### Rate Table Region Descriptions

This subsection describes the rate table subroutines used in the update phase of the program.

### Region QRATE

#### EXPLANATION OF REGION:

This region will initially create and subsequently update the rate table from type 4 inputs. It will write this table out on the NEW PERT COST MASTER and on cyclic runs will read it in from the OLD PERT COST MASTER. For deletions of performing unit resource code sets this routine will develop the UPDAD delete table that is carried in core only.

#### CALLING SEQUENCE:

L      TSX    QRATE, 4  
L + 1   Normal return

#### INPUT:

SORTED DATA TAPE (input type number 4)  
OLD PERT COST MASTER TAPE

#### OUTPUT:

The RTBAR table developed in core and set out on the NEW PERT COST MASTER TAPE.  
The UPDAD table

#### STORAGE USED:

RTBAR - 4003 words - rate table location  
UPDAD - 46 words - delete table location  
UP 450 - 14 words - card image  
UP 451 - 81 words - unpacked card image

#### SUBREGIONS AND SUBROUTINES USED:

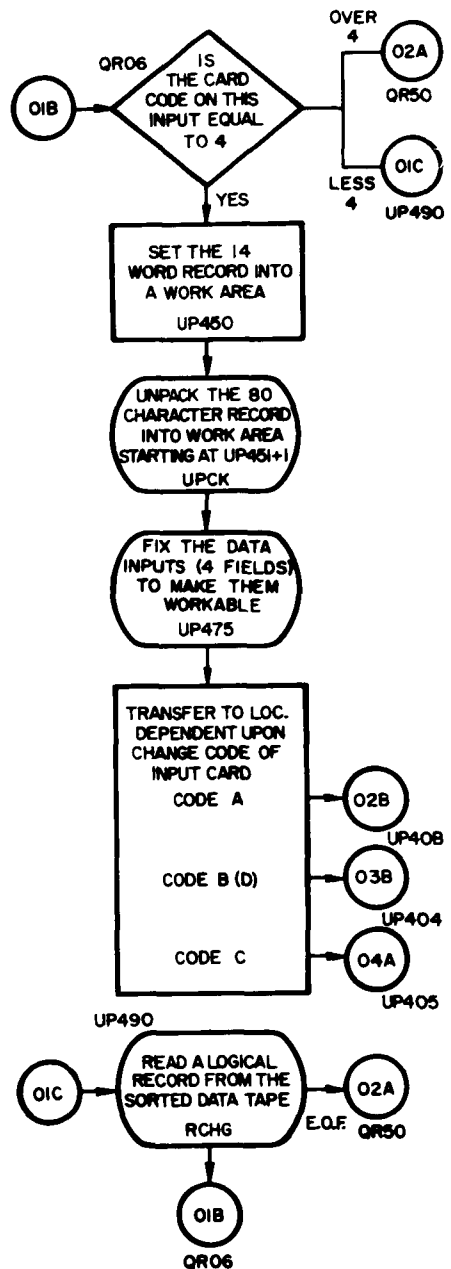
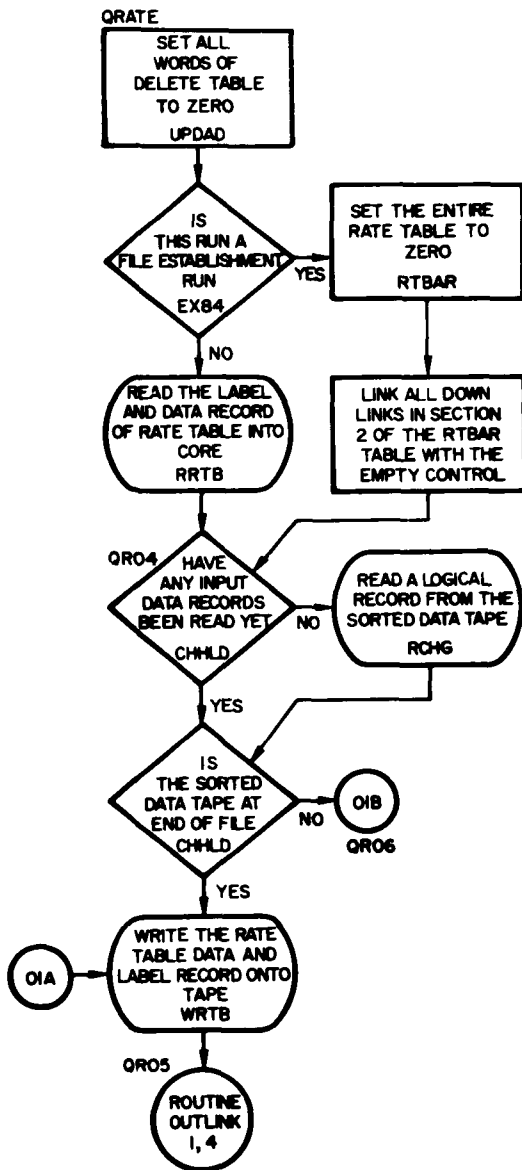
|       |      |
|-------|------|
| UX10  | RRTB |
| UX20  | RCHG |
| UX30  | WRTB |
| UX40  | UPCK |
| UP475 |      |

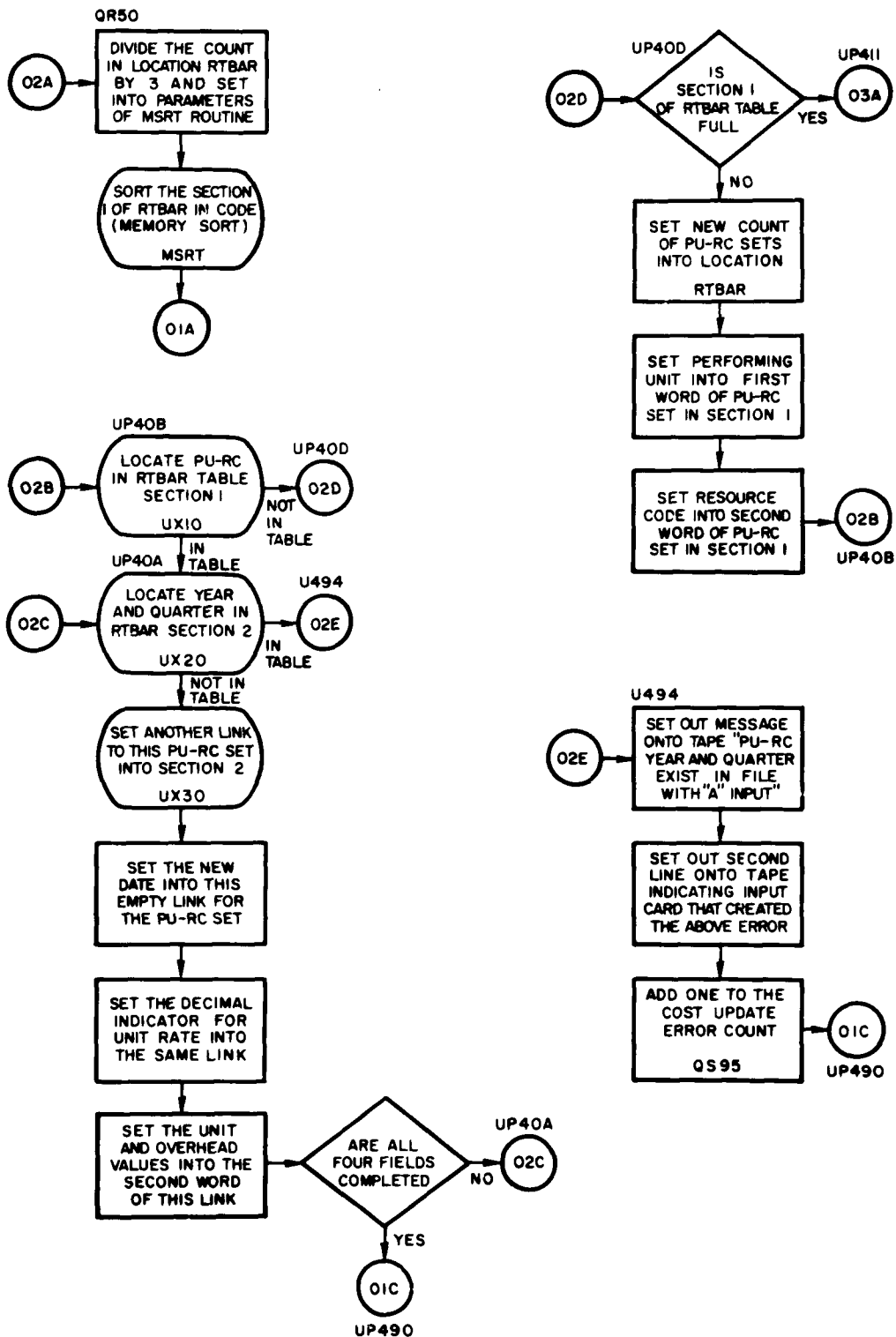
#### EXPLANATION OF CALLING SEQUENCE:

Not applicable.

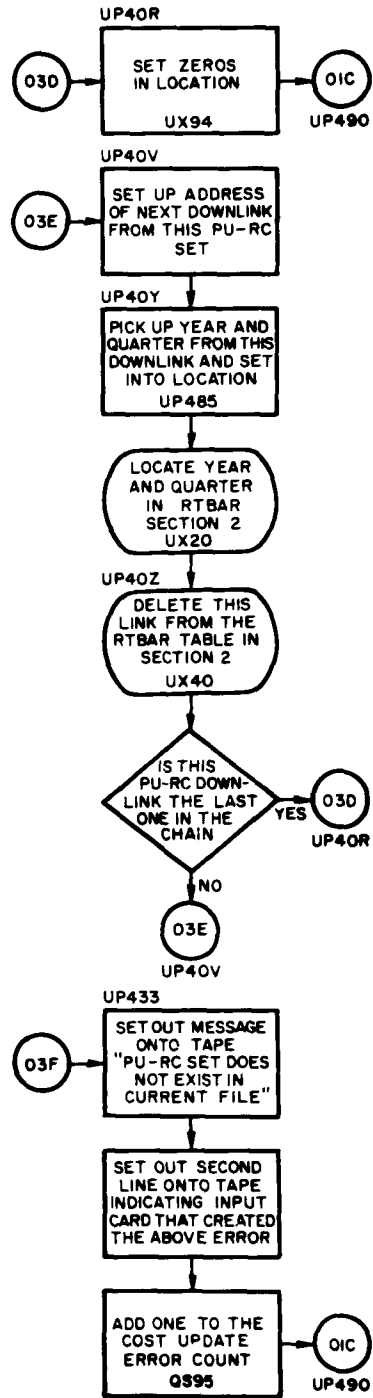
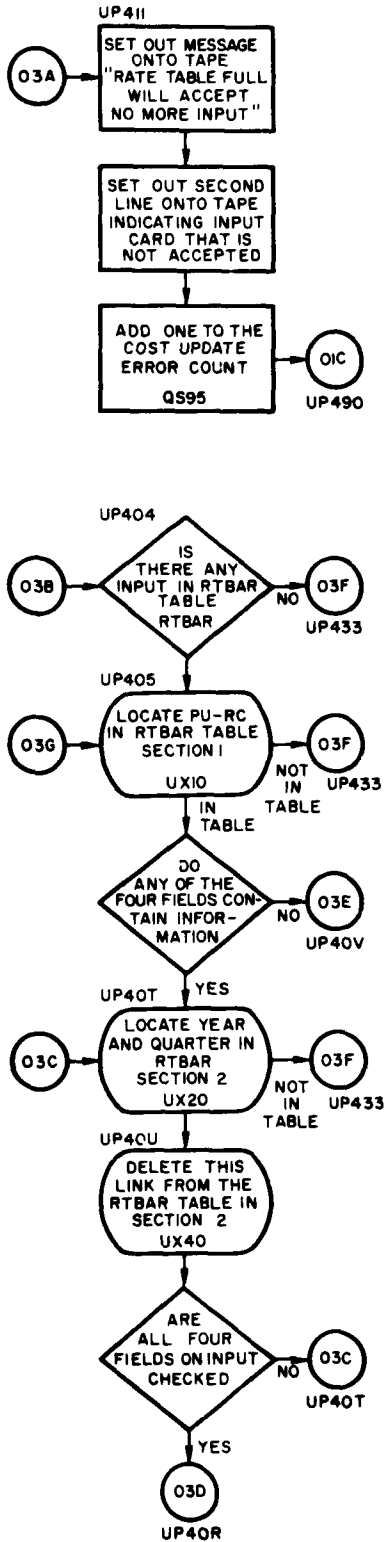
# REGION QRATE

## SET UP RATE TABLE



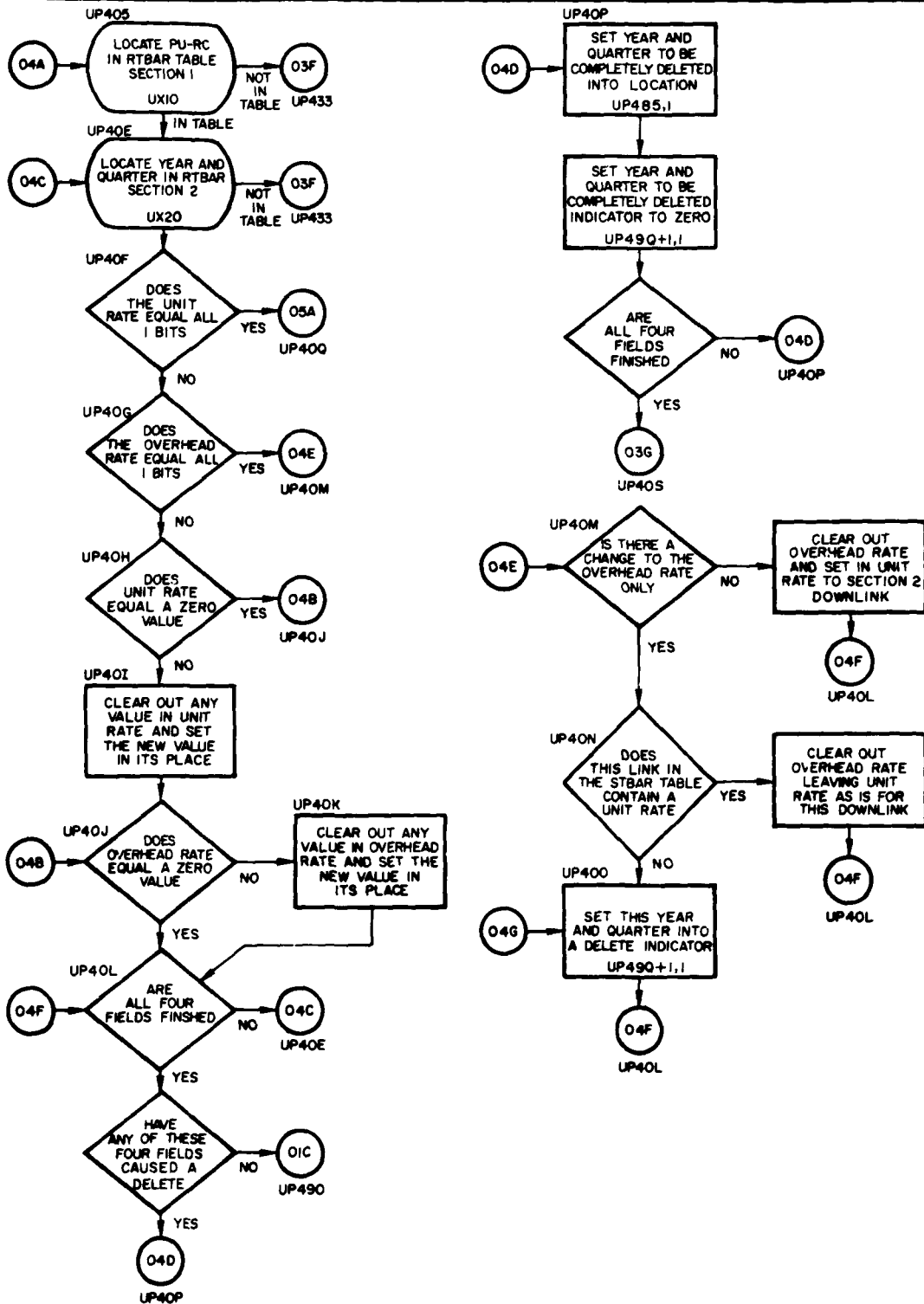


# REGION GRATE

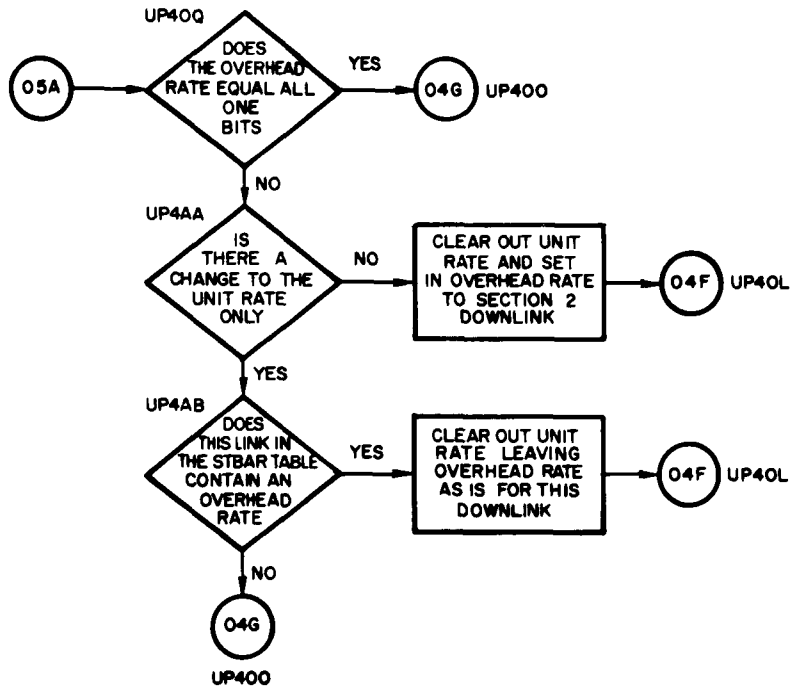




# REGION GRATE



# REGION GRATE



### Region UX10

#### EXPLANATION OF REGION:

This routine will attempt to match up a 4-card performing unit/resource code or resource code combination with the Section 1 items in the table.

#### CALLING SEQUENCE:

L      TSX    UX10, 4

L + 1   This combination not located in table return

L + 2   This combination found in table return

#### INPUT:

The performing unit/resource code in words 2 and 3 of UP450.

#### OUTPUT:

XR 2 contains the channel of matched-up performing unit/resource code combination.

#### STORAGE USED:

Not applicable.

#### SUBREGIONS AND SUBROUTINES USED:

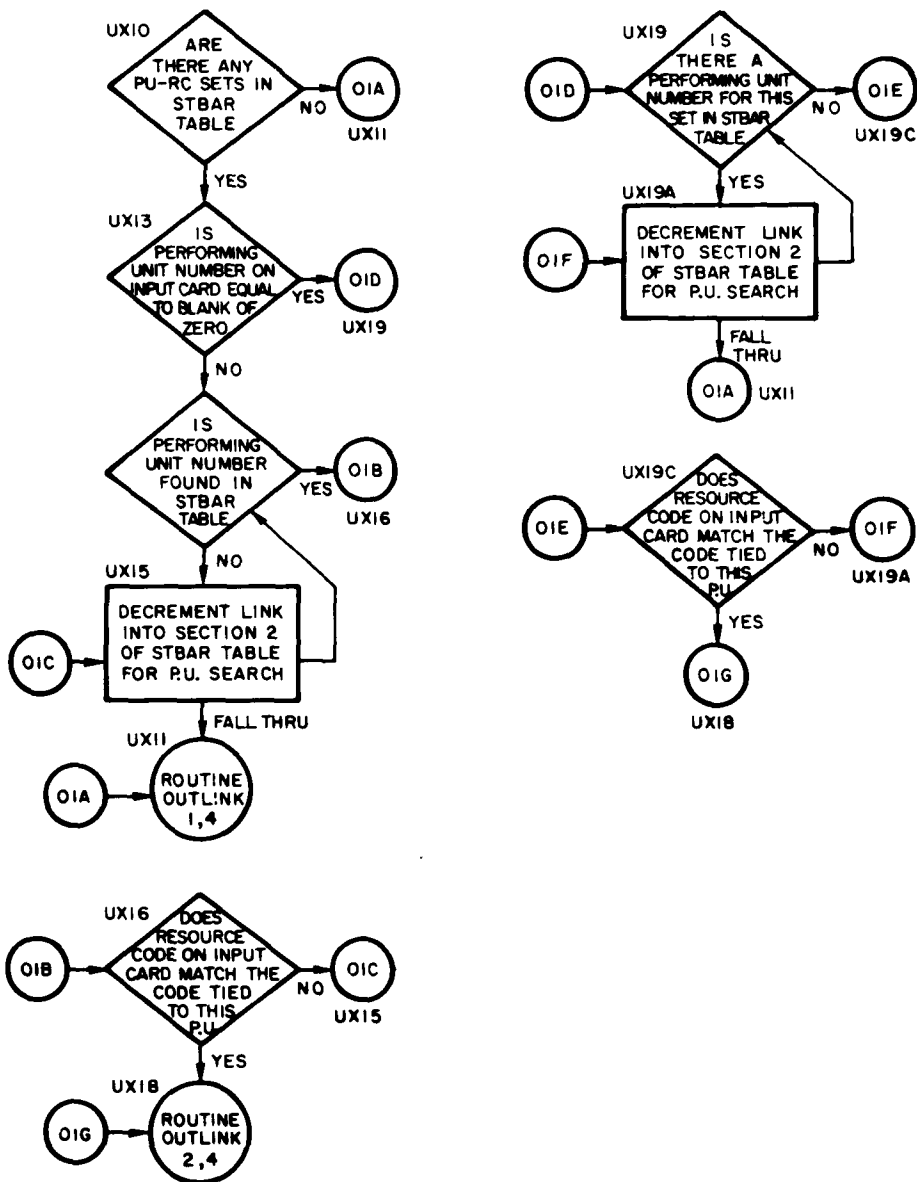
Not applicable.

#### EXPLANATION OF CALLING SEQUENCE:

The output described in this specification refers to line L+2 of the calling sequence.

REGION UX10

LOCATE PU-RC IN STBAR  
TABLE - SECTION I



### Region UX20

#### EXPLANATION OF REGION:

This routine will attempt to match up a 4-card year-and-quarter or year, relating to a Section 1 combination, with the data set up in Section 2 of the rate table.

#### CALLING SEQUENCE:

L       TSX   UX20, 4  
L + 1   The year-and-quarter located in table return  
L + 2   The year-and-quarter not found in table return

#### INPUT:

The year-and-quarter set into location UP485.

#### OUTPUT:

The absolute location containing the year-and-quarter or year slot in the rate table at UX22.

#### STORAGE USED:

Not applicable.

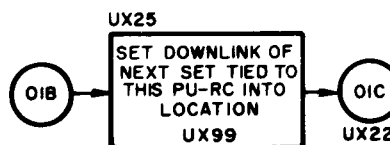
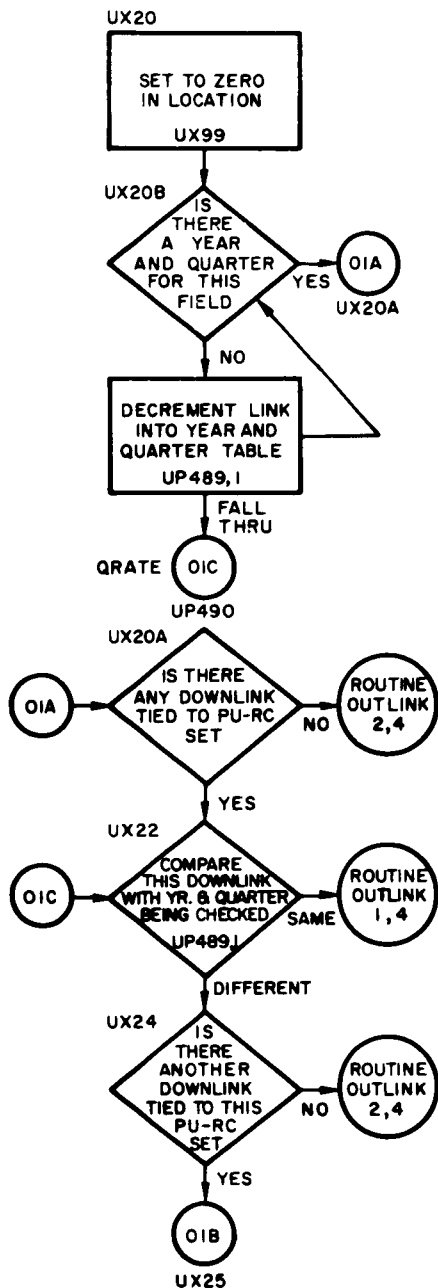
#### SUBREGIONS AND SUBROUTINES USED:

Not applicable.

#### EXPLANATION OF CALLING SEQUENCE:

The output described in this specification refers to line L+2 of the calling sequence.

LOCATE YEAR AND QUARTER  
TIED TO STBAR TABLE -  
SECTION 2



Region UX30

EXPLANATION OF REGION:

This routine will tie another link to the performing unit/resource code combination in Section 2 of the rate table. It will set in another year-and-quarter or year for this combination in Section 1.

CALLING SEQUENCE:

L      TSX    UX30, 4

L + 1   Normal return

INPUT:

Not applicable.

OUTPUT:

The address of UX31 will contain the slot being set up for the new link.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

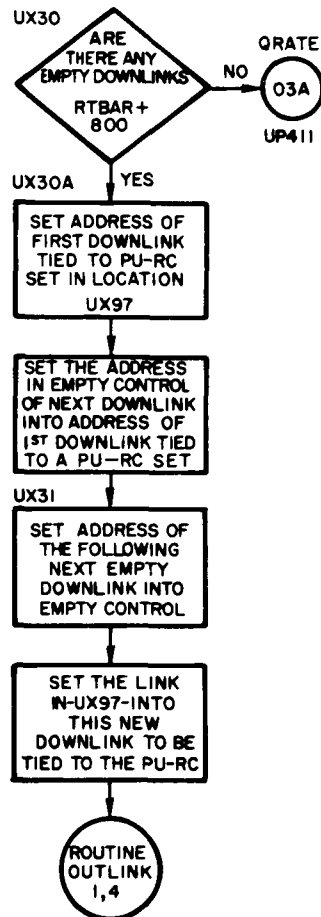
Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION UX30

SET ANOTHER LINK TO THE  
PU-RC SET IN SECTION 2  
OF RTBAR





Region UX40

EXPLANATION OF REGION:

This routine will remove a link from a performing unit/resource code combination in Section 2 of the rate table. If this link was the last one tied to this combination it will set it into the UPDAD delete table.

CALLING SEQUENCE:

L      TSX    UX40, 4

L + 1   Normal return

INPUT:

Not applicable.

OUTPUT:

UPDAD table.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

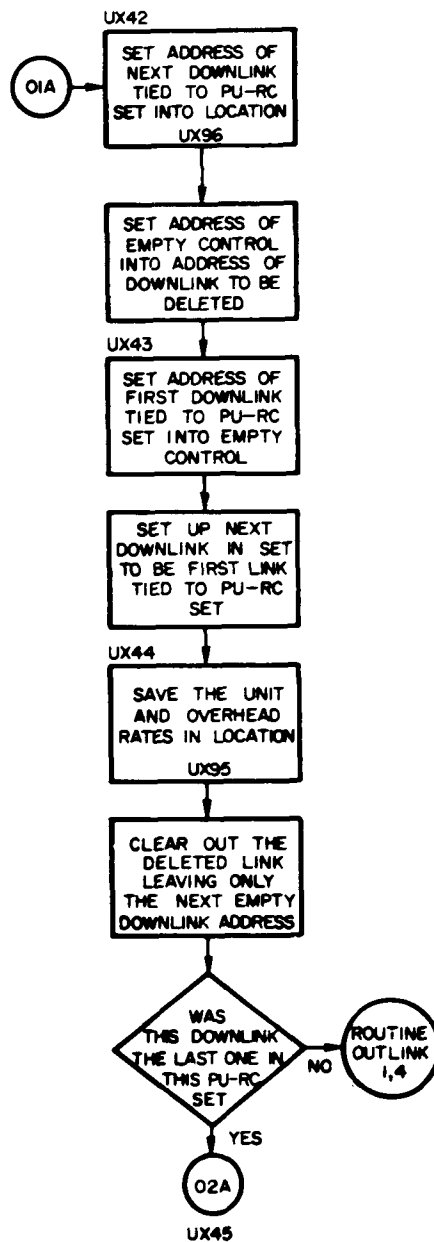
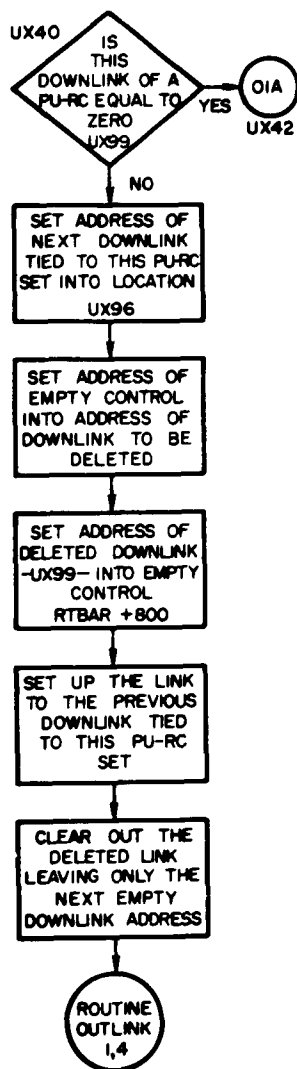
Not applicable.

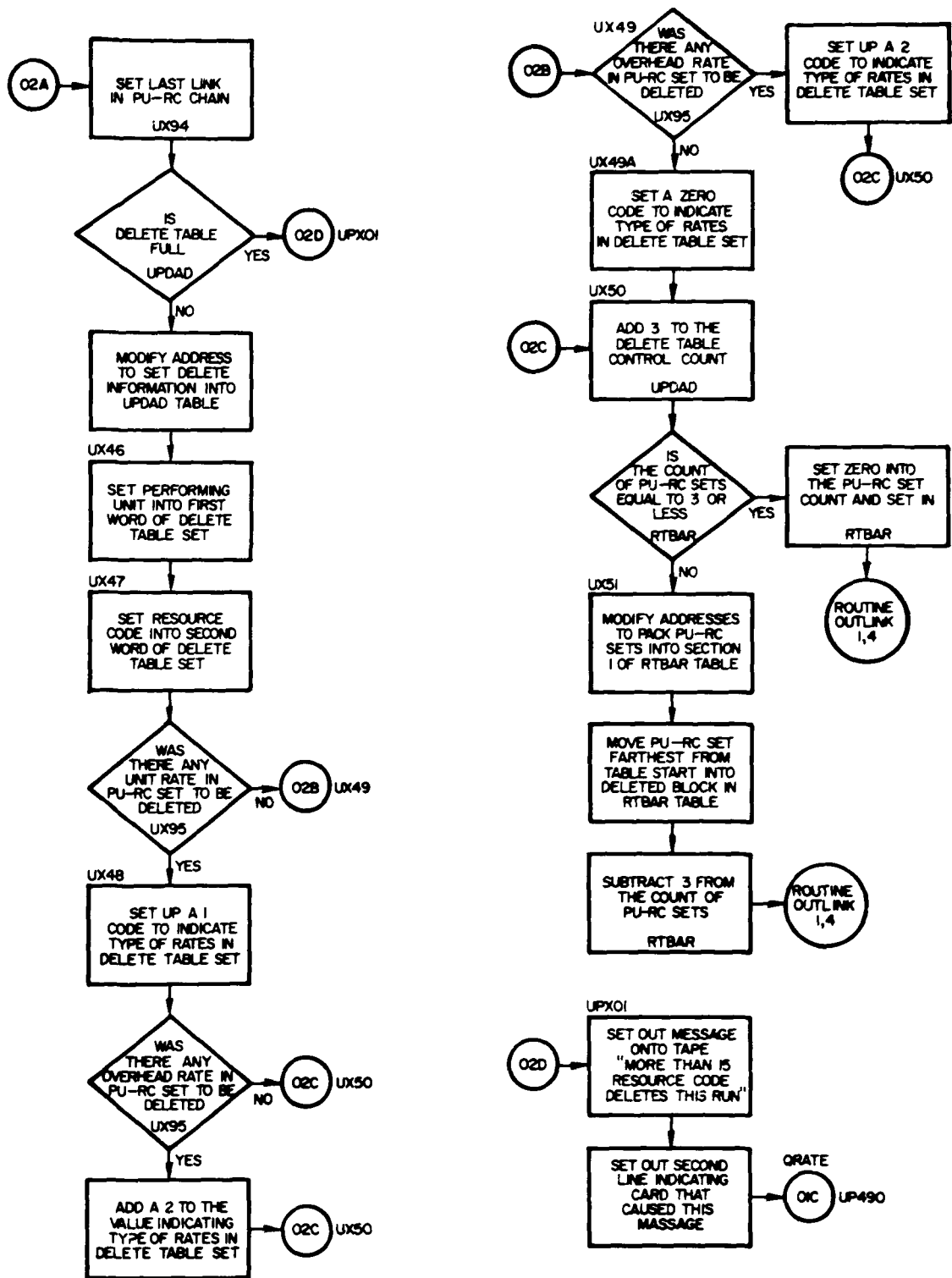
EXPLANATION OF CALLING SEQUENCE:

Not applicable.

# REGION UX40

REMOVE A DOWNLINK  
FROM THE RTBAR TABLE





### UP475

#### EXPLANATION OF REGION:

This routine will decipher the Type 4 card input and set all four fields into a form that is operable. It will set up the correct scaling factors for the unit rates.

#### CALLING SEQUENCE:

L       TSX    UP475, 4  
L + 1   Normal return

#### INPUT:

Type 4 input cards

#### OUTPUT:

The data set into UP481 - UP488 and UP49C - UP49F. These locations represent the four quarters on the input card. If one or more of these quarters are blank these locations will be set to zero.

#### STORAGE USED:

UP481 - UP484 - 4 words - hold year-and-quarter or year  
UP485 - UP488 - 4 words - hold unit and overhead rates  
UP49C - UP49F - 4 words - hold decimal indicator for unit rate

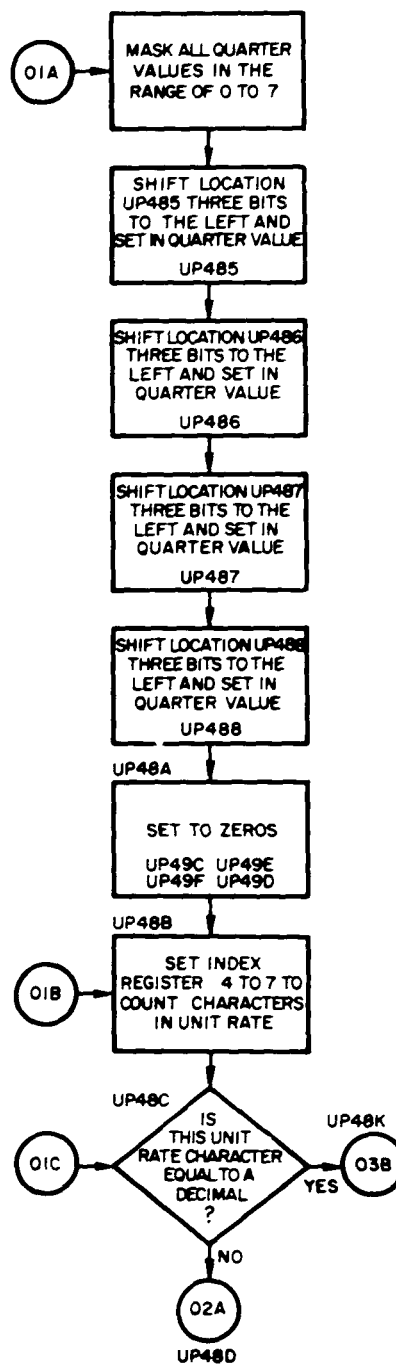
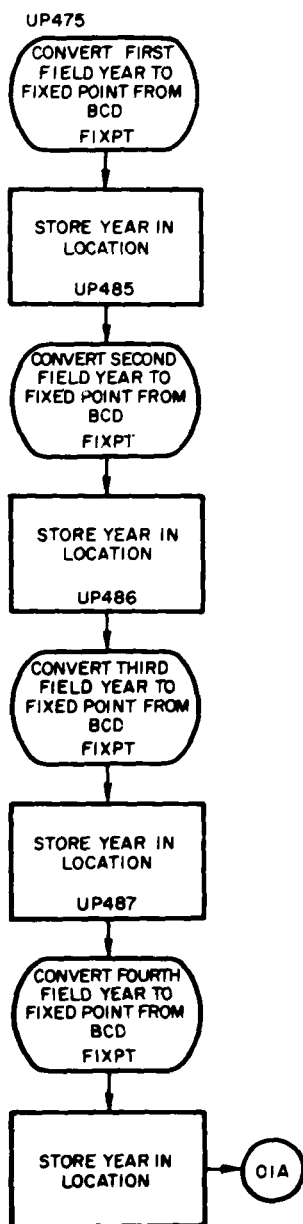
#### SUBREGIONS AND SUBROUTINES USED:

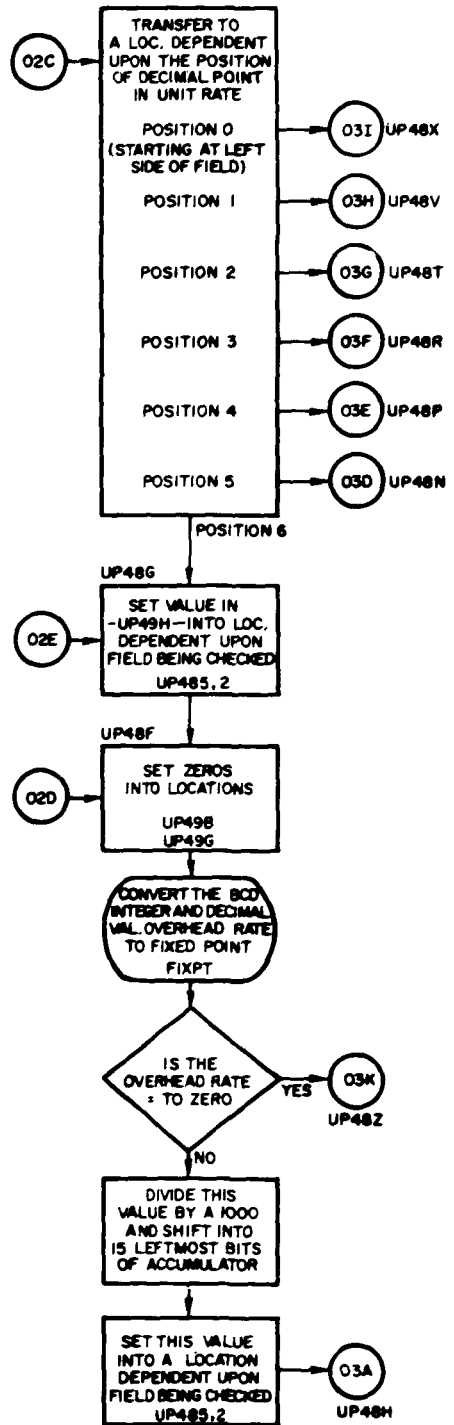
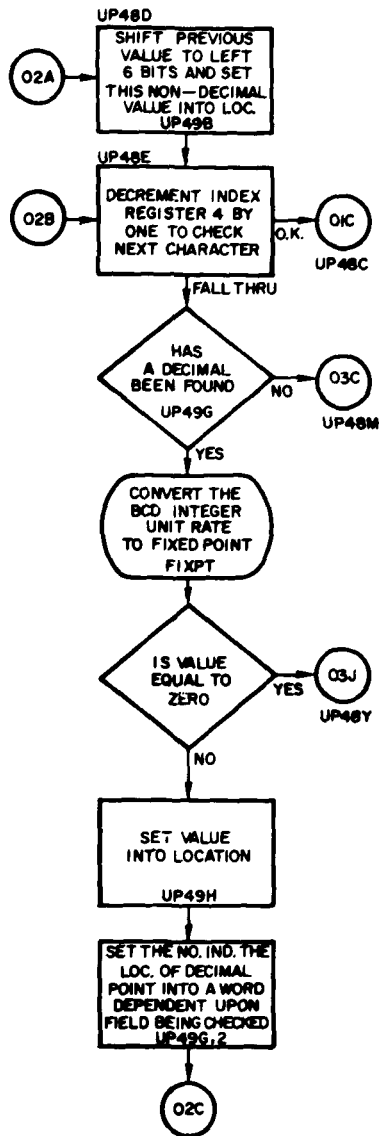
FIXPT

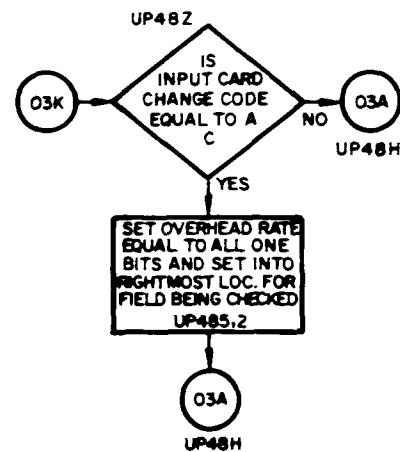
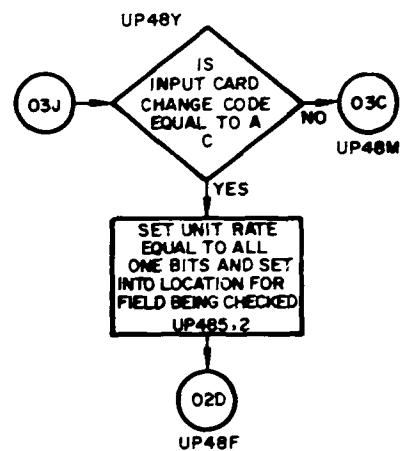
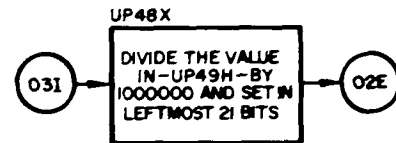
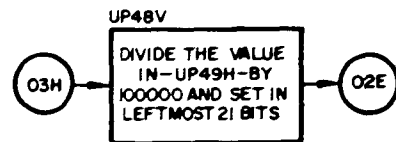
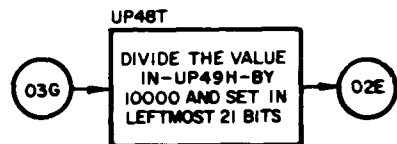
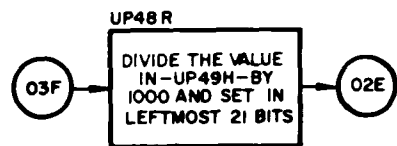
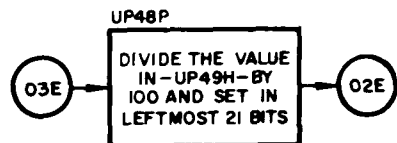
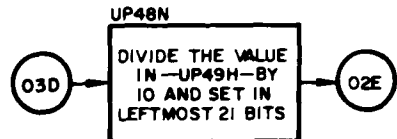
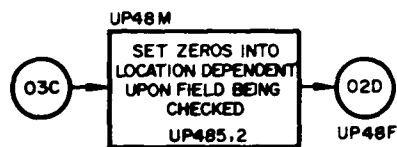
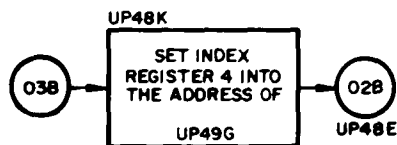
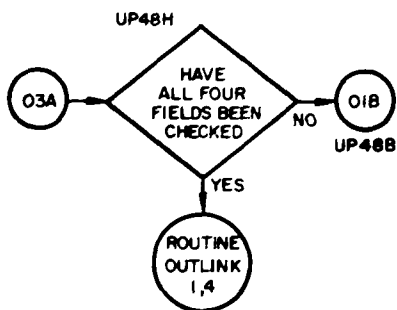
#### EXPLANATION OF CALLING SEQUENCE:

Not applicable.

FIX THE DATA INPUTS  
FROM INPUT DATA TO  
WORKING AREA







### Cost Update Skill Table

The skill table used in the PERT Cost program will actually perform two functions. It will tie a resource code to a rainbow category as well as to a cost category. Each of these functions will act independently of the other, and other than using the same table they will not have any common relationships. This table will tie together certain families of resource codes to cost categories, and other groupings of resource codes to rainbow categories. This tie-in is accomplished by use of the Type 5 and Type 6 inputs from THE SORTED DATA TAPE and is used to produce the "Cost Category and Rainbow Category Reports."

The Type 5 inputs from the SORTED DATA TAPE are used to change, add, or delete the rainbow category from a resource code, and Type 6 inputs are used to change, add, or delete the cost category from a resource code. Since, as stated earlier, each of these inputs will act independently of the other, an add to one of these categories may not actually add a new resource code to the table but may only set this cost or rainbow category in an existing resource code. This same premise holds true for deletes, in that if a category is deleted from a resource code this resource code may not be removed if the other category still relates to this resource code.

On file establishment, the skill table is developed in core at STBAR, and after completing the read-in of all Type 5 and 6 cards it is set out on the NEW PERT COST MASTER. On the cyclic updating runs, this table is read in from the OLD PERT COST MASTER and set into core at STBAR. It is then updated, if any Type 5 or 6 cards are present, and then set out on the NEW PERT COST MASTER. The skill table will remain in core during the entire cost update phase.



The skill table is broken down into two separate tables, or portions. One section is of 80 words and contains the 4-word rainbow categories, allowing for a maximum of 20 categories. The second portion of this table is of 1000 words consisting of the resource code, the cost category (if any), and the relative location of the rainbow category (if any) in Section 1. (At least one of these categories must be present in order for the resource code to remain in the table.) The resource code set of information will contain five words no matter what categories are present, thereby allowing for a maximum of 200 sets of resource codes in Section 2. It is then possible to have from 1 to 200 cost categories tied to the resource code sets, since each cost category is carried, by name, in the resource code set.

#### Skill Table Error Messages

In developing and updating the STBAR table from the types 5 and 6 input cards, the following error or exception messages can be produced, depending on the type of error. Both rainbow and cost category input errors will produce the same set of messages. The card image following the message will indicate which of the two categories caused the message. This card image will differ from the actual input due to a reformatting in the edit phase (see Page III-D-11). All of these errors will be set out on the SYSTEM ERROR TAPE.

- (a) AN ERROR EXISTS ON THE FOLLOWING CARD  
RESOURCE CODE NOT IN CURRENT FILE  
XX - 80 characters of input card - XX

This message will be set out when a Type 5 or 6 input is attempting to change one of the categories that does not exist. The third line of this message will be an 80-character representation of the input card that caused this error. This representation will likewise follow all of the messages below.

- (b) SKILL TABLE FULL. FOLLOWING CARD NOT ACCEPTED.

The table has reached its maximum of 200 resource code sets and this card is not being processed.

- (c) AN ERROR EXISTS ON THE FOLLOWING CARD  
RESOURCE CODE EXISTS IN THE CURRENT FILE

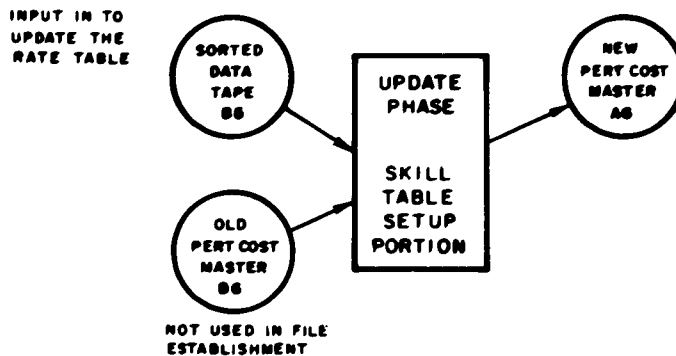
This message will be set out when a Type 5 or 6 input is attempting to add a category type to a resource code that currently contains a category.

- (d) AN ERROR EXISTS ON THE FOLLOWING CARD  
RAINBOW CATEGORY NOT IN CURRENT FILE

This message will be set out when a Type 5 input is attempting to delete an entire rainbow category from Section 1 and cannot locate it in the STBAR table.

#### Skill Table Tape Operations

After the rate table has been set on the NEW PERT COST MASTER TAPE the skill table will be set on. If the system is in the file establishment mode, the Type 5 and Type 6 inputs are brought in from the SORTED DATA TAPE and are set into the table at STBAR. This table is set out onto the NEW PERT COST MASTER. If this system is to be run without any tie-in to the cost or rainbow categories, a skill table of 1080 words is set out on tape with all zeros. If this system is not in a file establishment mode, the skill table is read in from the OLD PERT COST MASTER into its core location at STBAR. It is then updated, if any Type 5 or 6 inputs are present, and written out on the NEW PERT COST MASTER. The following will show the tapes that can be used during this portion of the update phase.



### Skill Table Layouts

The layout in Fig. III-G-8 shows the STBAR table as it is carried in core. The table is divided into two sections: one of 80 words, and one of 1000 words. The first section of this table will carry the rainbow categories in 4-word blocks. This data will be assigned a relative address in Section 1 of the table and will always be found at that location. The relative address will then be set into the fifth word of the Section 2 resource code set in order to link a rainbow category to a resource code. A zero in the fifth word of the resource code indicates that there is no tie-in to a rainbow category. The relative addresses will be in the range of 1 to 76.

Any rainbow category input entering the system as an add or change that cannot be found in Section 1 of the STBAR table will be automatically set in. The add or change code will refer only to the resource code and not the categories. The delete code, however, can refer to both resource codes and categories.

| STBAR  | 5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 |  |
|--------|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
| WORD 0 |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| +1     |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| +2     |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| +3     |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| +4     |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| +79    |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| +80    |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| +81    |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| +82    |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| +83    |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| +84    |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| +85    |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| +1074  |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| +1075  |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| +1076  |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| +1077  |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| +1078  |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| +1079  |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |

SECTION 1

RAINBOW CATEGORY 1

RAINBOW CATEGORY 1 (CONT.)

RAINBOW CATEGORY 1 (CONT.)

RAINBOW CATEGORY 1 (CONT.)

RAINBOW CATEGORY 2

RAINBOW CATEGORY 20 (CONT.) (IF ANY)

RESOURCE CODE

COST CATEGORY \*\*\*\*

COST CATEGORY (CONT.)

COST CATEGORY (CONT.)

RELATIVE LOCATION OF RAINBOW CATEGORY IN SECTION 1 THAT IS TIED TO THIS RESOURCE CODE

RESOURCE CODE

RELATIVE LOCATION OF RAINBOW CATEGORY IN SECTION 1 THAT IS TIED TO THIS RESOURCE CODE

RESOURCE CODE

COST CATEGORY

COST CATEGORY (CONT.)

COST CATEGORY (CONT.)

RELATIVE LOCATION OF RAINBOW CATEGORY IN SECTION 1 THAT IS TIED TO THIS RESOURCE CODE

SECTION 2

RAINBOW CATEGORY 2

RAINBOW CATEGORY 2 (CONT.)

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RAINBOW

\* THIS SECTION IS NOT IN ANY SORTED ORDER AND CAN CARRY UP TO 20 RAINBOW CATEGORIES

\*\* A RESOURCE CODE SET CAN HAVE EITHER A COST OR RAINBOW CATEGORY TIED TO IT OR CAN HAVE BOTH OF THEM TIED TO IT

\*\*\* THIS SECTION WILL BE SORTED BY RESOURCE CODE

\*\*\*\* THE SAME COST CATEGORY CAN BE RELATED TO MANY RESOURCE CODES

Fig. III-G-8. Skill Table Record

The second section of this table will be sorted by resource code and packed up to the top so that all unused portions will be at the bottom. The information carried in the second section will be the resource code number, cost category tied to that resource code, if any, and the relative location of the rainbow category in Section 1, if any. The STBAR table will allow for up to 200 resource code sets in Section 2.

#### Skill Table Region Descriptions

The following is a description of the skill table subroutine used in the update phase of the program.

### Region QRAIN

#### EXPLANATION OF REGION:

This region will initially create and subsequently update the skill table from type 5 and type 6 inputs. It will write this table out on the NEW PERT COST MASTER and on cyclic runs will read it from the OLD PERT COST MASTER.

#### CALLING SEQUENCE:

L       TSX    QRAIN, 4  
L + 1   Normal return

#### INPUT:

SORTED DATA TAPE (input types 5 and 6)  
OLD PERT COST MASTER TAPE

#### OUTPUT:

The STBAR table developed in core and set out on the NEW PERT COST MASTER TAPE

#### STORAGE USED:

STBAR - 1080 words - skill table location  
UP450 - 14 words - card image  
UP451 - 81 words - unpacked card image

#### SUBREGIONS AND SUBROUTINES USED:

|      |      |
|------|------|
| UPCK | RCHG |
| WSTR | RSTR |
| MSRT |      |

#### EXPLANATION OF CALLING SEQUENCE:

Entry into this subroutine will be made at QRAIN at which point by translating the input card type and change code a transfer will be made to one of the following locations:

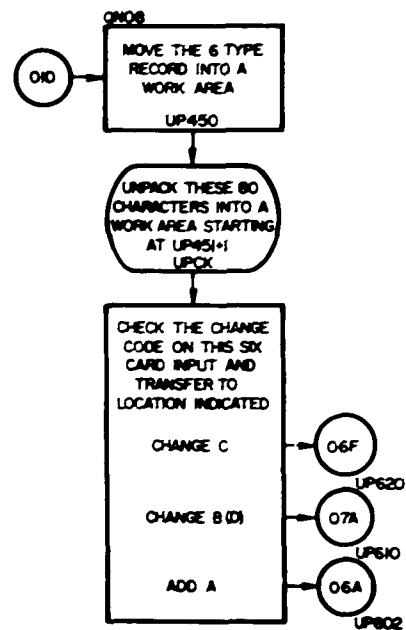
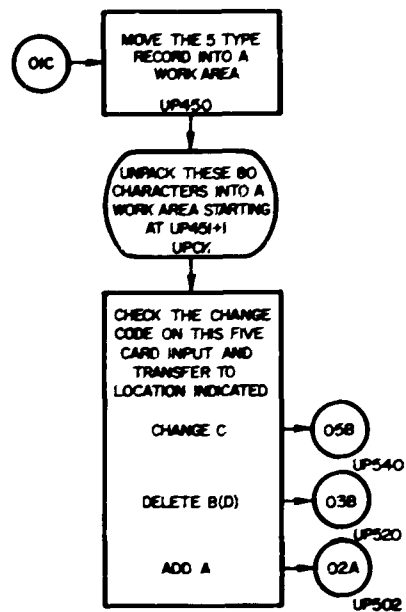
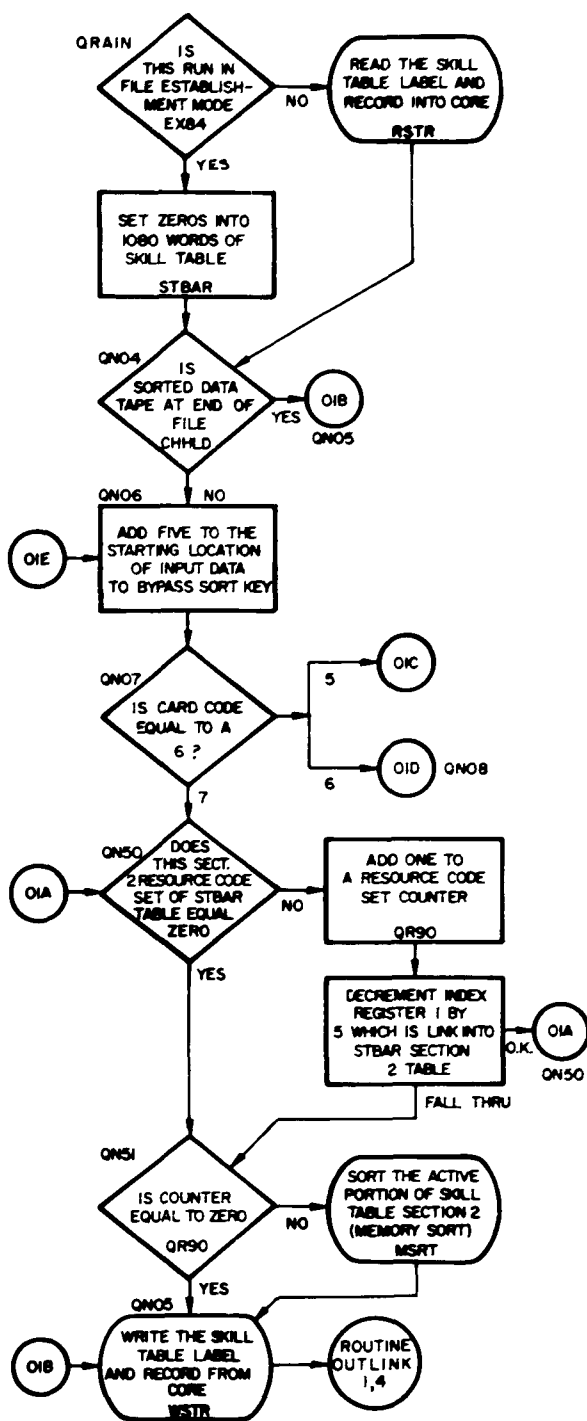
|               |            |               |            |
|---------------|------------|---------------|------------|
| Type 5 Add    | - to UP502 | Type 6 Add    | - to UP602 |
| Type 5 Change | - to UP540 | Type 6 Change | - to UP620 |
| Type 5 Delete | - to UP520 | Type 6 Delete | - to UP610 |

Region QRAIN (continued)

EXPLANATION OF CALLING SEQUENCE: (continued)

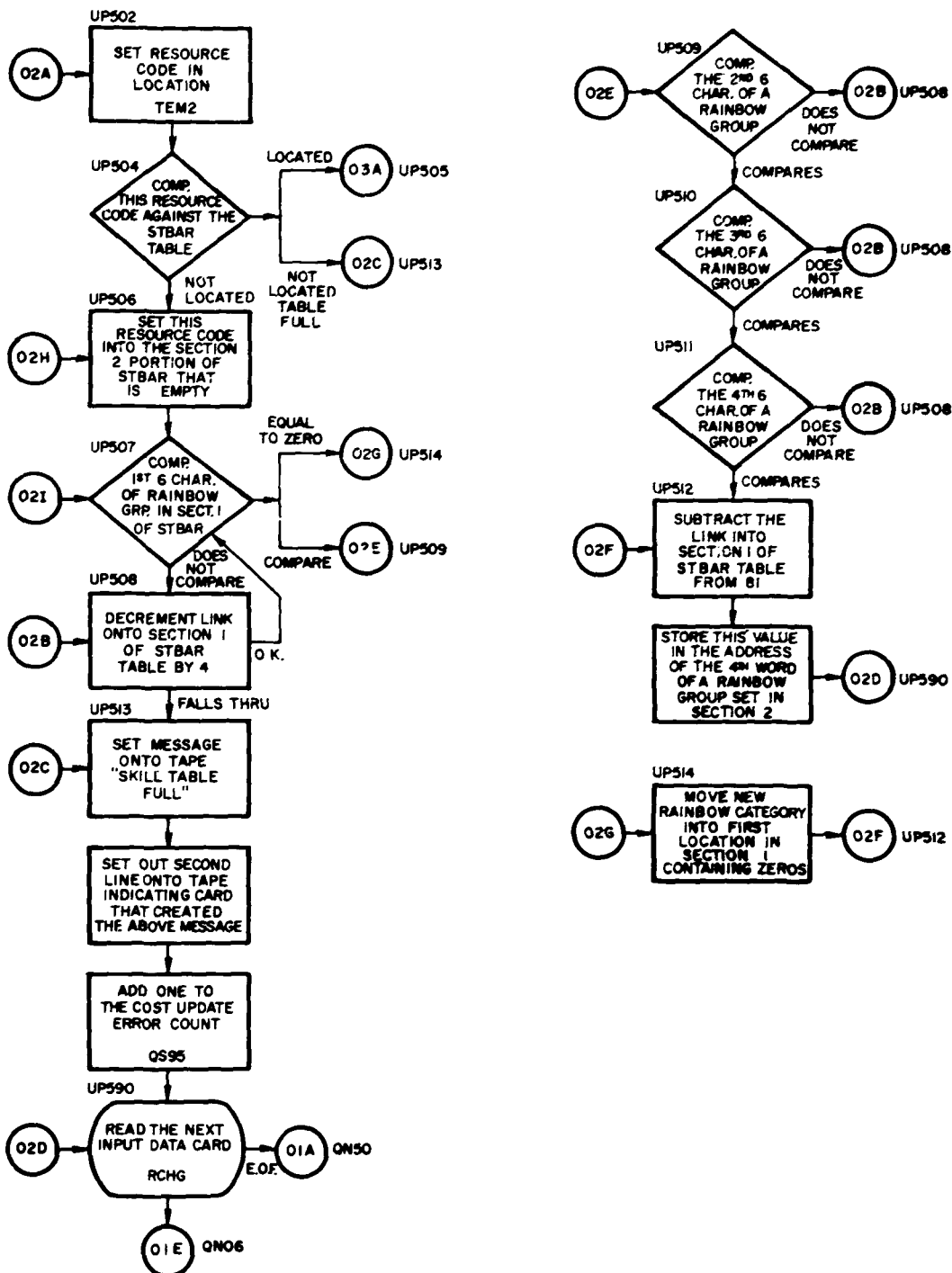
After processing has been completed in these areas the program will then go back and read another input card and transfer to one of the above locations again. After all 5 and 6 input cards have been processed control is returned to the outlink.

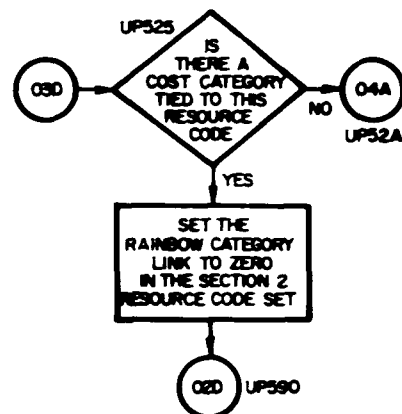
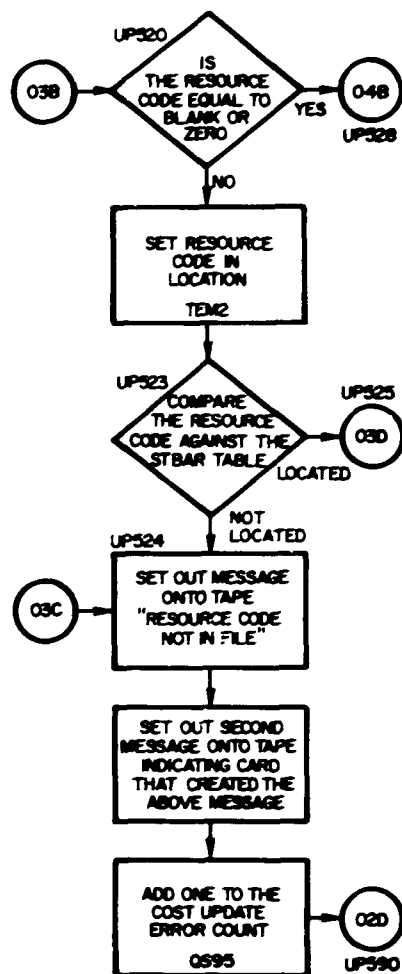
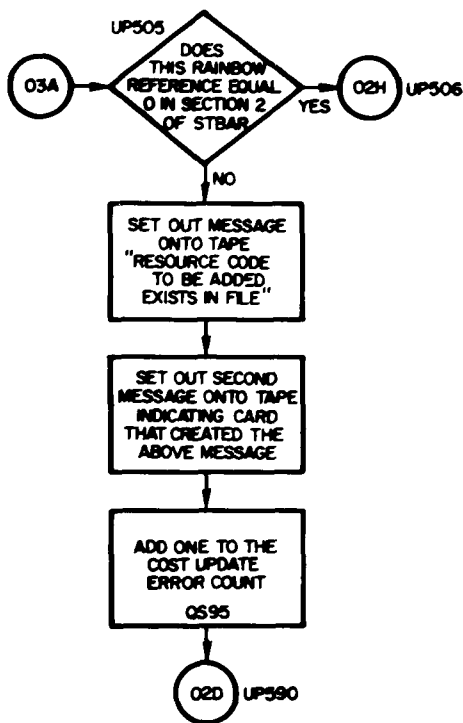
SET UP RAINBOW AND  
COST CATEGORY TABLES



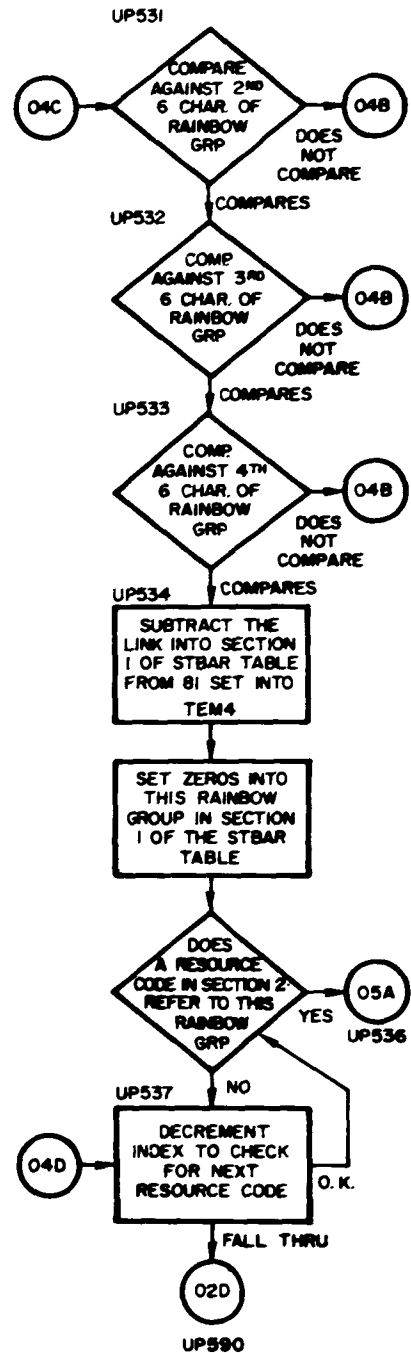
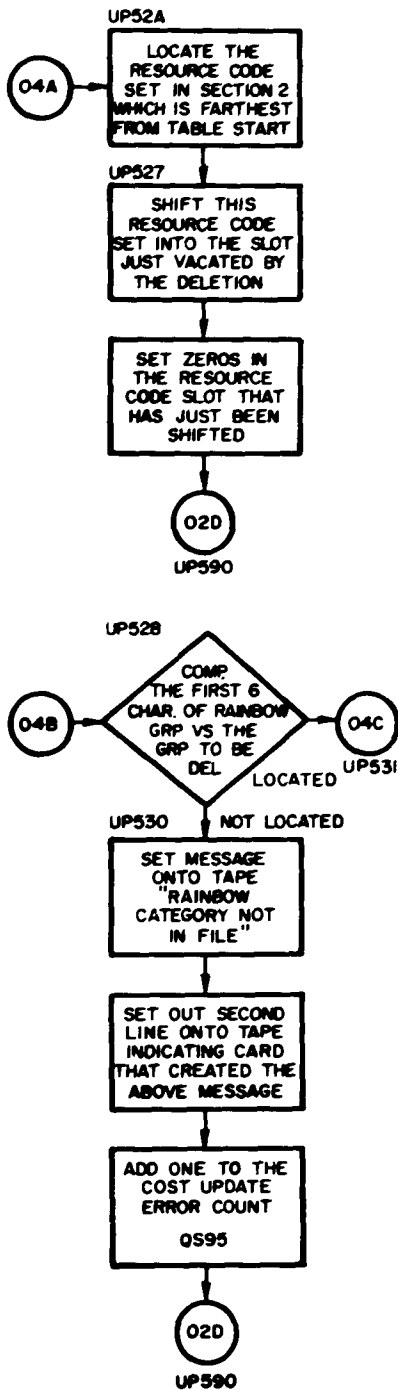


# REGION GRAIN

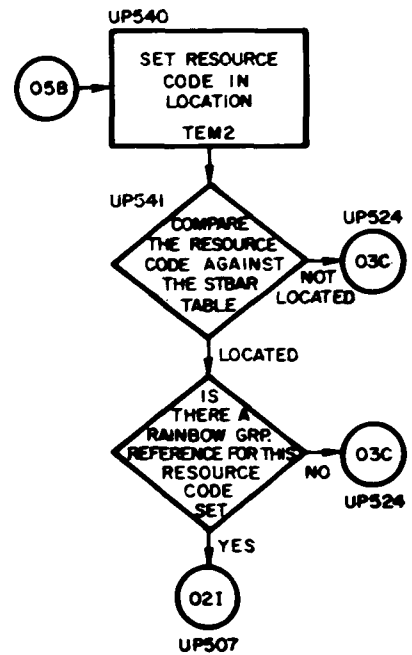
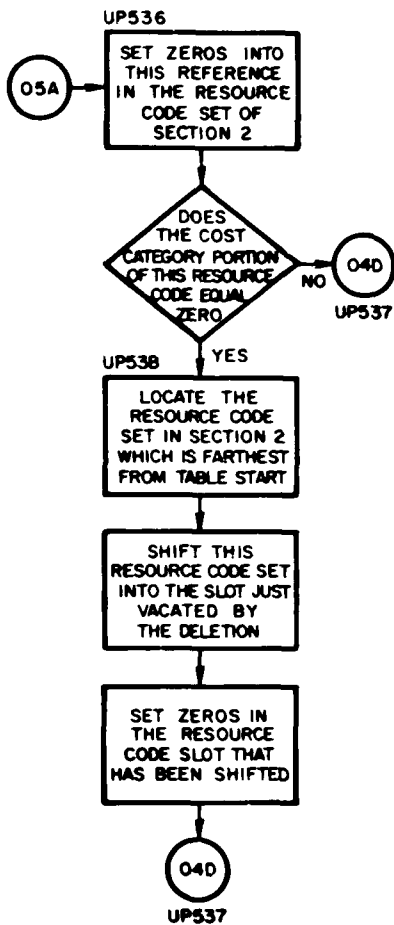




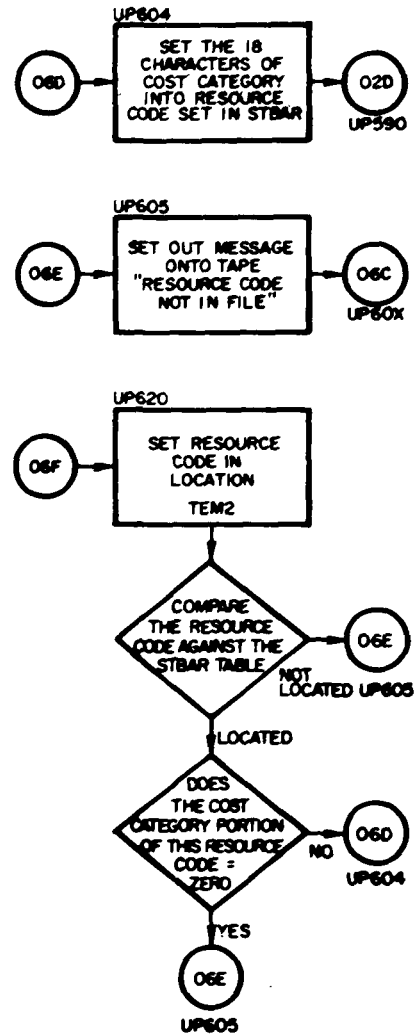
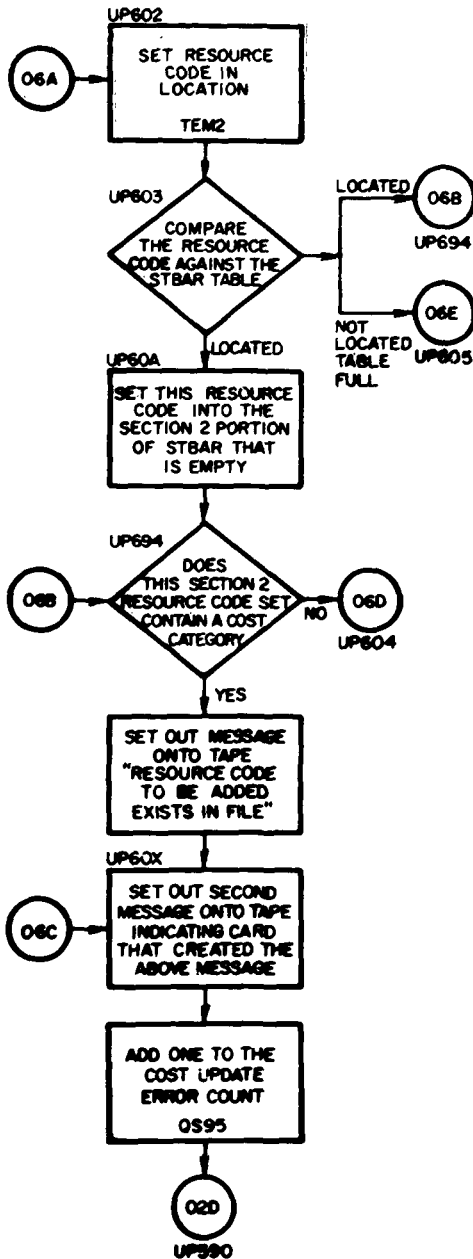
# REGION QRAIN

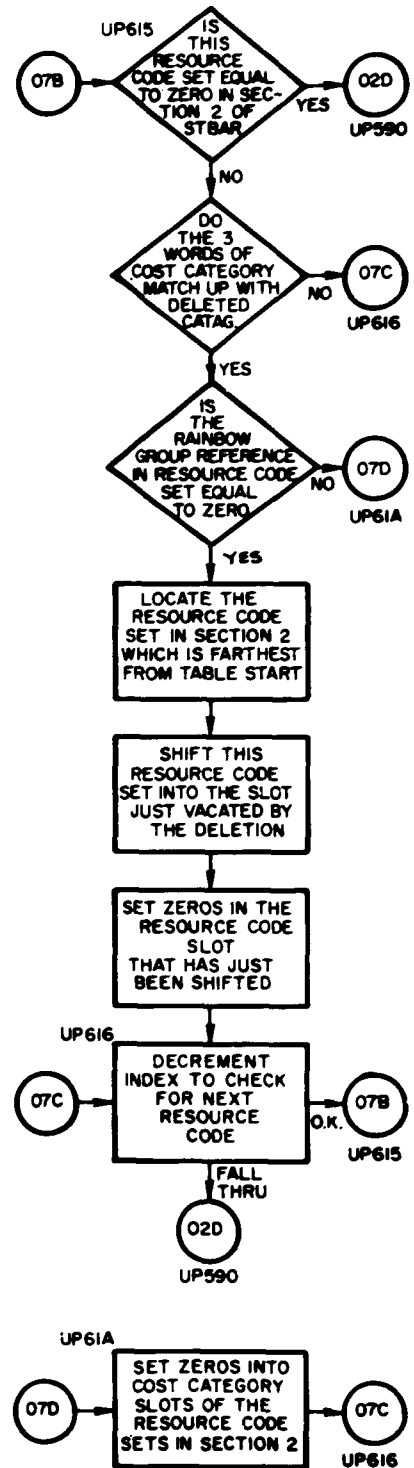
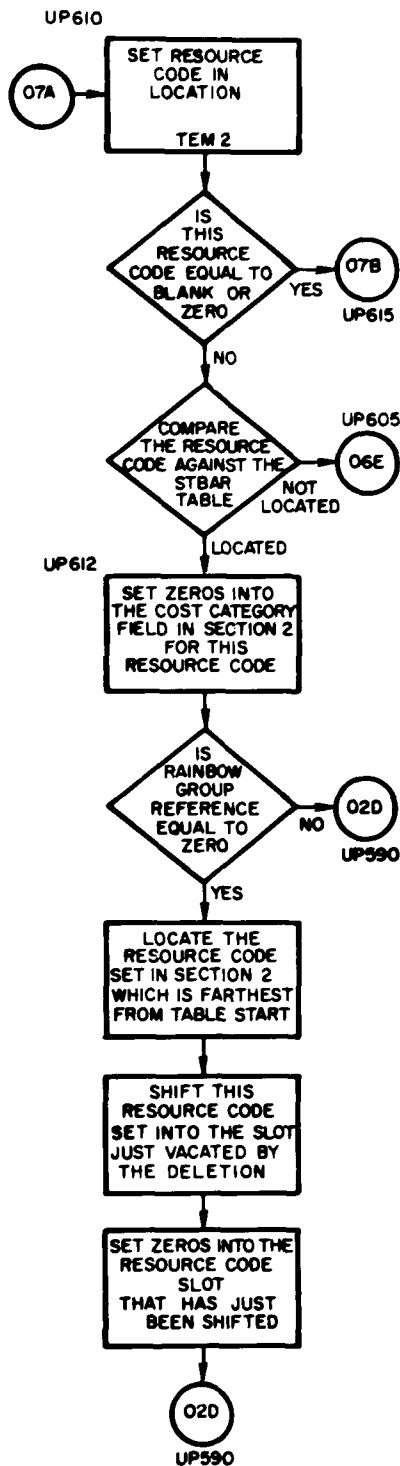


# REGION GRAB



# REGION GRAIN



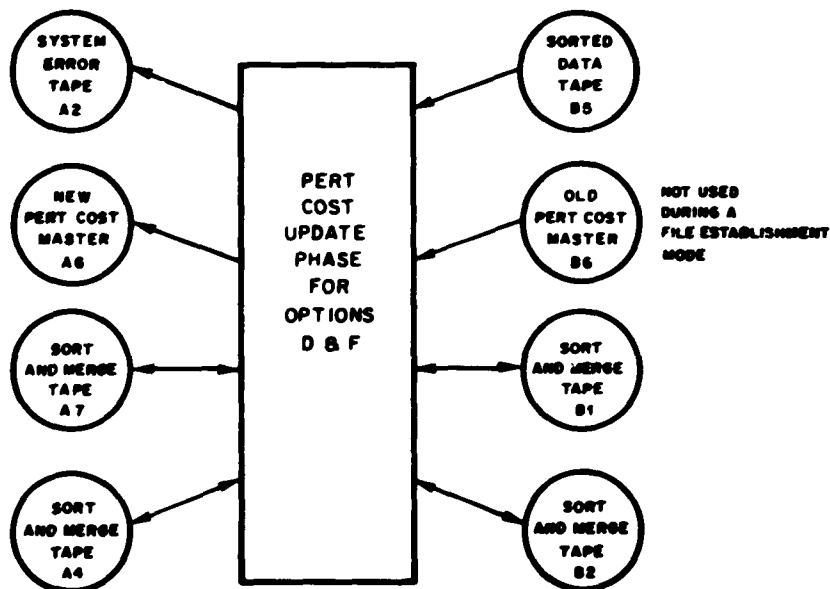


### Cost Update Phase Tape Operations

The tape manipulations that are required for the update phase will vary with the option requested. The tape configurations for these three groups of options will be set up as follows.

#### Options D and F

If the program is running under one of these options it will have read a USERS TIME TAPE in the PERT time merge phase. The time records are then sorted in charge number sequence using the 4-tape sort. The results can be either on channel A or B depending on the number of merge passes. The channel opposite the side containing the results of the time merge will be set up to receive the data to be sorted for output reports, again using the 4-tape sort. The information that is read in during the update phase, excluding file establishment time, will be the SORTED DATA TAPE B5, OLD PERT COST MASTER B6, and the time information from the 4-tape sort. The following tape flow will show the configuration for options D and F in the update phase.



The USERS TIME TAPE B4 has been rewound and unloaded during the time merge phase and is not used during this update phase. When the program is operating in a file establishment mode the OLD PERT COST MASTER TAPE B6 is not needed, since the program will be creating a NEW PERT COST MASTER TAPE from input data only.

Any error messages that will not stop the program will be set out on the SYSTEM ERROR TAPE A2 and the count of the errors will be set out as described on Page III-G-6. This tape will not be rewound at the end of this phase, since it will become the SYSTEM OUTPUT TAPE and most reports will be written as a second file on this tape. The SORTED DATA TAPE will hold all the cost inputs into the system. If these were inputs for the time merge, this tape will be positioned past the last time merge input and will read the first cost input at the beginning of this phase. At the end of the update phase all of the inputs on the SORTED DATA TAPE should be completed and this tape is rewound and unloaded. The OLD PERT COST MASTER, if not in a file establishment mode, and the NEW PERT COST MASTER are both rewound and unloaded at the end of this phase.

The information making up the PERT COST MASTER is actually the second data file on the tape. The first data file will be the input parameters and the activities tied to charge number information. Two end-of-file marks are placed on this tape behind the activities tied to charge number data when the time merge phase is completed, but the tape is not rewound. At the beginning of the Cost Update phase this second data file, consisting of rate table, skill table, and PERT Cost information, is set onto this PERT COST MASTER. When this phase is completed, two more end-of-file marks are placed on this tape, and it is rewound and unloaded. Both data files on this tape are created in a binary mode and are blocked. A maximum of nine reels of the NEW PERT COST MASTER can be created as well as a maximum of nine reels of the OLD PERT COST MASTER read for any program run.

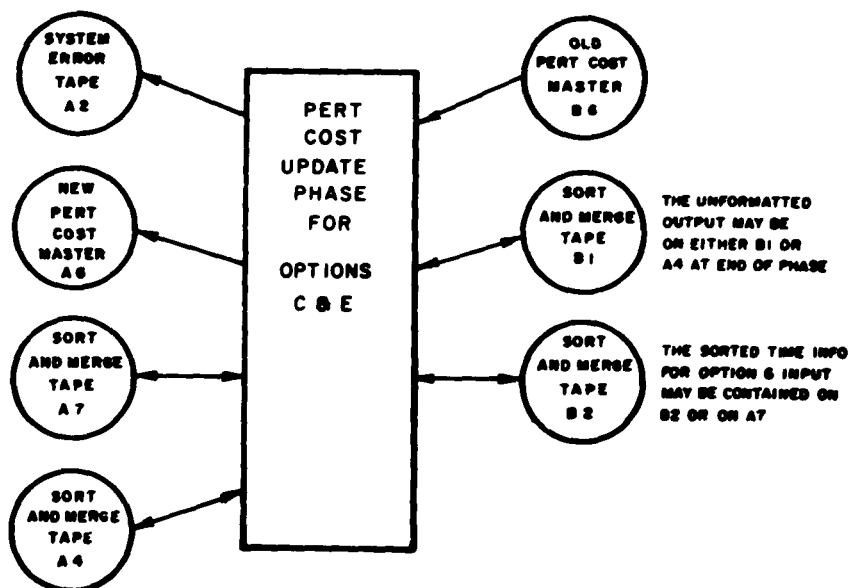
If it is found necessary to list the SYSTEM ERROR TAPE, it will be printed out off-line at the completion of the update phase. If the errors indicated on this list have to be corrected before any reports can come out, the program



is then removed from the machine. The input errors then are removed from the data deck, corrected, and set back into the deck to begin operating again. The program will then be restarted from the beginning.

### Options C and E

Under Option C or E the program essentially bypasses the update phase. During the preceding time merge phase, the program has created a SORTED TIME TAPE to be used when operating under Option G. In the update phase, the program will set out information to print the Work Package/Activity Report, which is an automatic feature for these options. These options can not run under a file establishment mode, since the data needed from the cost files would not be present if running under this mode. The following tape flow will show the configuration for Options C and E in the update phase. The USERS TIME TAPE B4 will have been read previous to this phase as explained in Options D and F. The handling of the sort tapes will vary from that explained in options D and F in that after the completion of the 4-tape sort, where the time records are sorted in charge number sequence, the output information does not go into a sort. The channel opposite the side containing the results of the time merge will be set up to write the SORTED TIME TAPE and the output data for the Work Package/Activity Report.



Tape A7 or B2, depending on the channel available, will be the tape that contains the sorted time information, and A4 or B1 will contain the unformatted output report information.

The SORTED DATA TAPE B5 should be completed during the time merge phase and rewound and unloaded during that phase. The program expects no cost input data during the update phase for Options C and E. The information on the OLD PERT COST MASTER is duplicated on the NEW PERT COST MASTER, with the exception of the program name if the name has changed. All other data is reproduced exactly as carried on the OLD PERT COST MASTER with the following fields being selected for use with the Work Package/Activity Report.

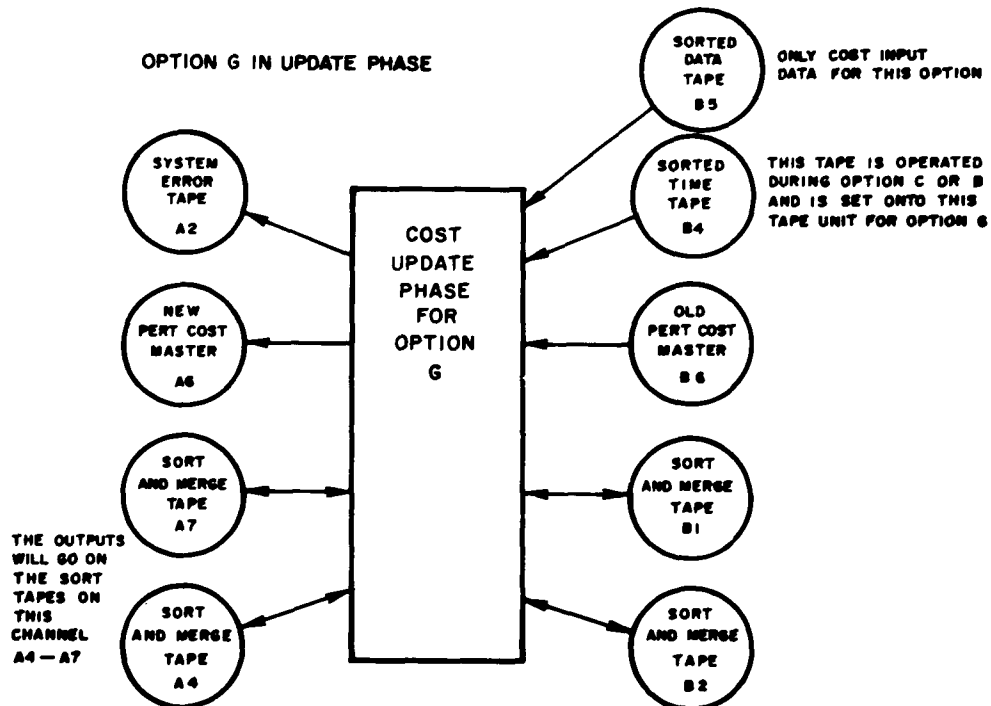
- (1) charge number level
- (2) charge number description
- (3) responsible organization

#### Option G

Under this option the program will be handled similarly to Options D or F except for the following conditions.

The time information in charge number sequence will be on a SORTED TIME TAPE that was created during Option C or E. This tape will be set onto B4. Since there is no sort involved to get this time information during option G, the data for the output reports can be set on the "A" channel without interrogating the sort program for the right channel. Option G will essentially bypass the time merge phase and therefore does not expect any Type 1 or Type 2 input data. The first record read from the SORTED DATA TAPE will be cost input data for this phase. The following tape flow will show the configuration for Option G in the update phase. It is possible, without any time information, to run Option G for both file establishment and cyclic running as requested by control card input. If this condition is requested, the SORTED TIME TAPE does not have to be present because the program will ignore this tape, and for file establishment the OLD PERT COST

MASTER is ignored. Thus, when time information is to be suppressed, the tape configuration as shown below does not include B4 for cyclic running and omits B4 and B6 for file establishment.



#### Cost Update Phase On-Line Messages

The messages forthcoming on the on-line printer regarding the update phase are.

(a) For Option D or F on File Establishment

TAPE A6 HAS BEEN SELECTED FOR WRITING  
 TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD  
 TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD  
 END OF PERT COST UPDATE PHASE

Following this last line will be the phase-ending messages described on Page III-G-6. These phase-ending messages likewise will follow the messages shown below.

(b) For Option D or F Not a File Establishment

TAPE B6 HAS BEEN SELECTED FOR READING  
TAPE A6 HAS BEEN SELECTED FOR WRITING  
TAPE B6 IS NOW REWINDING AND SHOULD UNLOAD  
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD  
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD  
END OF PERT COST UPDATE PHASE

Even though tapes B6 and A6 had been selected in the time merge phase they are again selected, since the program handles the SECONDARY MASTER and PERT COST MASTER as two separate master files though they are on the same physical tape.

(c) For Option D or F With Multiple Master Tapes

TAPE B6 HAS BEEN SELECTED FOR READING  
TAPE A6 HAS BEEN SELECTED FOR WRITING  
TAPE B6 IS NOW REWINDING AND SHOULD UNLOAD  
SET NEXT REEL OF SERIES ON TAPE B6  
TAPE B6 HAS BEEN SELECTED FOR READING  
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD  
SET NEXT REEL OF SERIES ON TAPE A6  
TAPE A6 HAS BEEN SELECTED FOR WRITING  
TAPE B6 IS NOW REWINDING AND SHOULD UNLOAD  
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD  
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD  
END OF PERT COST UPDATE PHASE

The above process of setting the next reel of series onto the tape units can continue for up to nine tapes on both A6 and B6. When this next-reel-of-series

message refers to B6, it is concerned with the next tape in the series that was created in a prior cyclic run. When it refers to A6, it means to set a blank or utility onto this tape unit. Since these tapes are not alternating, the program must wait until the indicated tape is rewound, unloaded, and a new tape loaded before it can proceed.

(d) For Option C or E

TAPE XX HAS BEEN SELECTED FOR WRITING  
TAPE B6 HAS BEEN SELECTED FOR READING  
TAPE A6 HAS BEEN SELECTED FOR WRITING  
TAPE XX IS NOW REWINDING AND SHOULD UNLOAD  
\*\*\* SAVE TAPE XX FOR NEXT RUN \*\*\*  
TAPE B6 IS NOW REWINDING AND SHOULD UNLOAD  
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD  
END OF PERT COST UPDATE PHASE

The tape indicated by XX will be the SORTED TIME TAPE that is created for use in Option G. Depending on the channel available for writing this tape, the number will be either A7 or B2. The SORTED DATA TAPE was completed in the time merge phase and the above series of messages does not refer to it.

(e) For Option G With No Time Information

This condition will take the same form as (b) above except for the inclusion of the following line prior to the referenced series of messages:

TAPE B5 HAS BEEN SELECTED FOR READING

This line will be found in the Update Phase messages because the only data carried on this tape will be cost inputs as indicated by Option G.

(f) For Option G With Time Information

This condition will read the SORTED TIME TAPE created in Option C and set onto the same physical tape as the USERS TIME TAPE. The series of messages for this situation are:

TAPE B5 HAS BEEN SELECTED FOR READING  
TAPE B4 HAS BEEN SELECTED FOR READING  
TAPE B6 HAS BEEN SELECTED FOR READING  
TAPE A6 HAS BEEN SELECTED FOR WRITING  
TAPE B5 IS NOW REWINDING AND SHOULD UNLOAD  
TAPE B4 IS NOW REWINDING AND SHOULD UNLOAD  
TAPE B6 IS NOW REWINDING AND SHOULD UNLOAD  
TAPE A6 IS NOW REWINDING AND SHOULD UNLOAD  
END OF PERT COST UPDATE PHASE

The order in which some of the tapes rewind and unload is dependent on the amount of information carried and the end-of-file mark. Therefore, some of the messages may vary slightly from that shown above.

Cost Update Phase Error Messages

The errors determined during the cost update phase are set out on the on-line printer when they will cause the system to stop, or they are set out on the SYSTEM ERROR TAPE if they do not cause a stop in the program.

The error messages that are set out on the SYSTEM ERROR TAPE, with the reason for each message, are as follows:

(a) AN INSERTION COULD NOT BE MADE FOR THE FOLLOWING CARD DUE TO NO 7-0 CARD.

XX - 80 characters of input card - XX

An input being processed by the system is attempting to add a new Performing Unit/Resource Code to a charge or summary number that has never been set up by means of a 7-0 card. The last line of this message will be a reproduction of the input card for which this message

applies. A reproduction of the troublesome input card will usually follow the other messages in this section.

**(b) THE FOLLOWING CARD WAS AN UNMATCHED DELETION OR CHANGE**

An input being processed by the system is attempting to delete or change a field in a charge or summary number record that does not exist.

**(c) THE FOLLOWING CARD WAS A MATCHED ADDITION**

An input being processed by the system is attempting to set up a charge or summary number, or Performing Unit/Resource Code for one that presently exists.

**(d) CANNOT UPDATE A DELETED RECORD, CARD REJECTED**

The input is attempting to update a record that has been deleted by a prior input card. This record may be a charge or summary number, or a Performing Unit/Resource Code.

**(e) A DATE HAS NON-NUMERIC CHARACTERS IN THE DD OR YY**

The charge number start or end date has a bad day or year in the 7-2 card as will be shown in the format set up below this message.

**(f) CANNOT LOCATE AN INDICATED MONTH**

The charge number start or end date has an illegitimate month field.

**(g) THE DAYS DO NOT FALL IN THE RANGE SPECIFIED BY ITS MONTH**

The number of days associated with a particular month does not fall in the range specified for that month.

**(h) XXX FIELD IN ACTUAL INPUT CARD OUT OF BOUNDS**

The date in one of the fields of this actual input varies by more than 60 months from the data presently carried in the file. The field on the actual input card that is involved will be indicated at the position marked XXX in the message.

The XXX will stand for the following information:  
1 = 1st, 2 = 2nd, 3 = 3rd, 4 = 4th.

(i) XXX FIELD TRIED TO DELETE ACTUAL NOT IN FILE

One of the fields on an actual input card is attempting to delete an actual field that has never been set up. The XXX refers to the same data as explained in (h) above.

(j) INPUT ON A DELETED RESOURCE CODE

After a resource code of a particular charge number and performing unit has been deleted, additional input attempting to modify this resource code is found. Every input of this type will be bypassed, and the above message with a reproduction of the card in error will be set out.

(k) THIS RESOURCE CODE IS RESERVED FOR XXXXX

Each resource code, if tied to hours or units, is so flagged in its record, and any input at the hours or units level must match this indicator. The XXXXX field in this message refers to (1) HOURS or (2) UNITS.

(l) DOLLAR INPUT FOR RESOURCE CODE WITH UNIT RATE

Since the dollar value will be a result of an extension using the rate table, the program will not accept any dollar inputs if that Performing Unit/Resource Code or Resource Code combination is tied to a unit rate.

(m) TOTAL DOLLARS FOR RESOURCE CODE WITH OVER-HEAD RATE

Since the total dollar value will be a result of an extension using the rate table, the program will not accept any total dollar inputs if that Performing Unit/Resource Code or Resource Code combination is tied to an overhead rate.

(n) DUPLICATE INPUTS FOR BUDGETS OR ESTIMATES

If two inputs are found to refer to the same charge number, performing unit, and resource code for the same months, the first input will be processed normally and the second will be bypassed, with the above message printed out.



The following messages will not have the 80 characters of the input card as a last line tied to the message.

- (o) TOTAL DOLLAR FIELD IS LESS THAN DIRECT DOLLARS  
ON XXXXXXXXXX

CHARGE NO. XXXXXXXXXXXXXXXXXXXX P. U. XXXXXX  
R. C. XXXX

When a particular month or set of months contain less dollar value in total dollars than in direct dollars, but not a zero value, this message is set out. On the first line the X's refer to one of the following three categories: (1) budgets, (2) estimates, (3) actuals. The second line will contain the charge number, Performing unit, and resource code involved in this situation.

- (p) ACTUAL TOTAL DOLLAR FIELD IS ZERO WITH A VALUE  
IN DIRECT DOLLARS

CHARGE NO. XXXXXXXXXXXXXXXXXXXX P. U. XXXXXX  
R. C. XXXX DATE MMMYY

When a particular month in the actual fields contains a zero in the total dollars and a value in direct dollars this message is set out. The second line will contain the charge number, performing unit, resource code, and month and year concerned with this problem. The program will move, for output purposes only, the direct dollars into the total dollars field. If budgets and estimates are also involved with this problem, the program will move the direct dollars into the total dollars field for output reporting only, but will not put out an exception message.

- (q) THE FOLLOWING ITEM COULD NOT BE DELETED DUE  
TO ACTUALS IN FILE

CHARGE NO. - XXXXXXXXXXXXXXXXXXXX  
PERF. ORG. - XXXXXX  
RES. CODE - XXXX

In attempting to delete a charge or summary number some actual dollar values were found which prevented this item from being deleted. The last portion of this message will contain the charge number, performing unit, and resource code that contain the actuals.

- (r) TIME RECORD IN ERROR -  
CHG. NO. XXXXXXXXXXXXXXXXXXXX  
PRED. XXXXXXXXXX SUCC. XXXXXXXXXX

The SORTED TIME TAPE contains a charge number that does not exist on the PERT COST MASTER TAPE. This message will contain the charge number involved, plus its predecessor and successor numbers. Each record found in error will be printed out.

The following messages will be set out on the on-line printer and will stop the system.

- (s) SEQUENCE ERROR ON FOLLOWING CARD  
XX - 80 characters of input card - XX

If the input cards from the SORTED DATA TAPE are not in a correct sequence this message is forthcoming. It will also print out the card that is out of sequence.

- (t) SEQUENCE ERROR ON OLD PERT MASTER

If the OLD PERT COST MASTER is not in a correct sequence this message will be set out. This will apply at the charge or summary number level as well as at the performing unit and resource code levels.

#### Cost Update Phase Region Descriptions

The following region descriptions will describe the major subroutines used in the cost update phase as well as the cost update itself.

## Region PUAO-SA00

### EXPLANATION OF REGION:

This region will handle the control section for the update phase. It will develop and modify the rate table, skill table, and PERT Cost data. It will read in the OLD PERT COST MASTER, the SORTED TIME TAPE and SORTED DATA TAPE, and write out the NEW PERT COST MASTER and the preliminary sort tape for the output phase.

### CALLING SEQUENCE:

L TRA PUAO

### INPUT:

OLD PERT COST MASTER FILE  
SORTED TIME TAPE  
SORTED DATA TAPE

### OUTPUT:

NEW PERT COST MASTER FILE  
Pre-reporting input tape

### STORAGE USED:

UCHG - 25 words - charge number record in core  
UPUN - 2 words - performing unit record in core  
QRES1 - 600 words - packed resource code information for writing  
on tape  
QRES2 - 600 words - unpacked resource code information for  
handling data

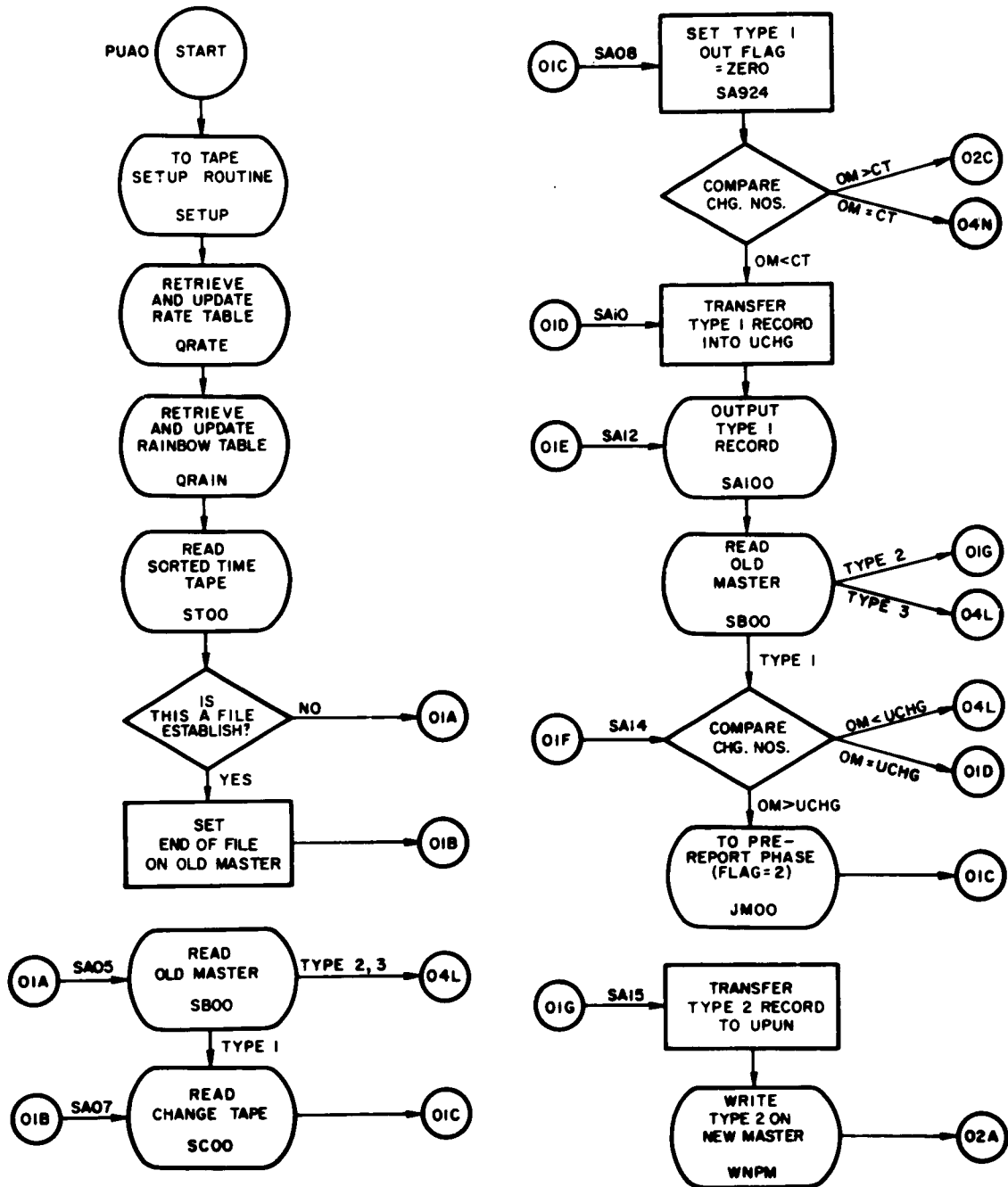
### SUBREGIONS AND SUBROUTINES USED:

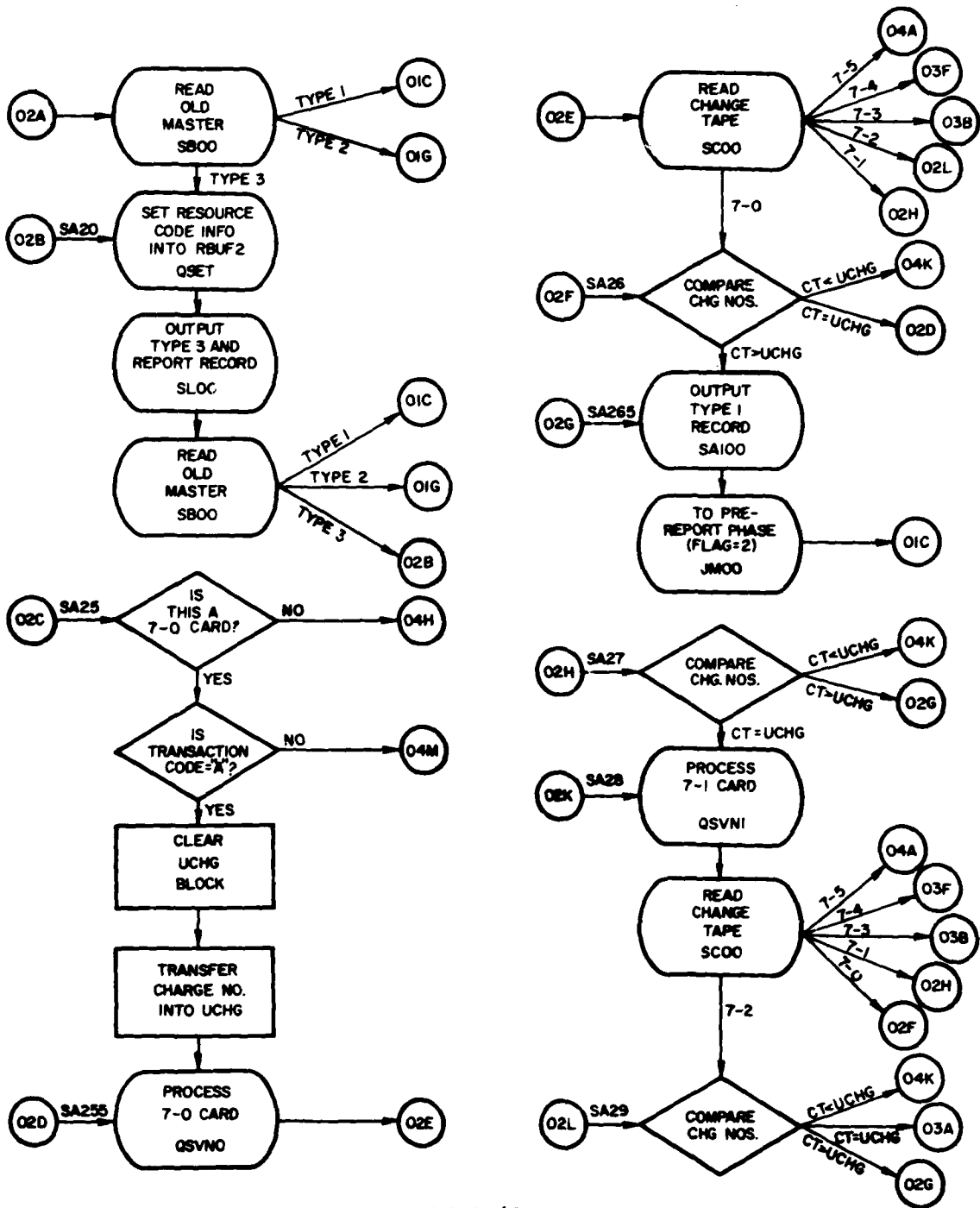
|       |       |       |       |       |
|-------|-------|-------|-------|-------|
| QRATE | QSET  | STOO  | QSVN1 | QSVN5 |
| QRAIN | QSRCH | SDOO  | QSVN2 | WNPM  |
| SBOO  | QCLN  | SFOO  | QSVN3 | SETUP |
| SCOO  | JMOO  | QSVNO | QSVN4 | QSRTB |

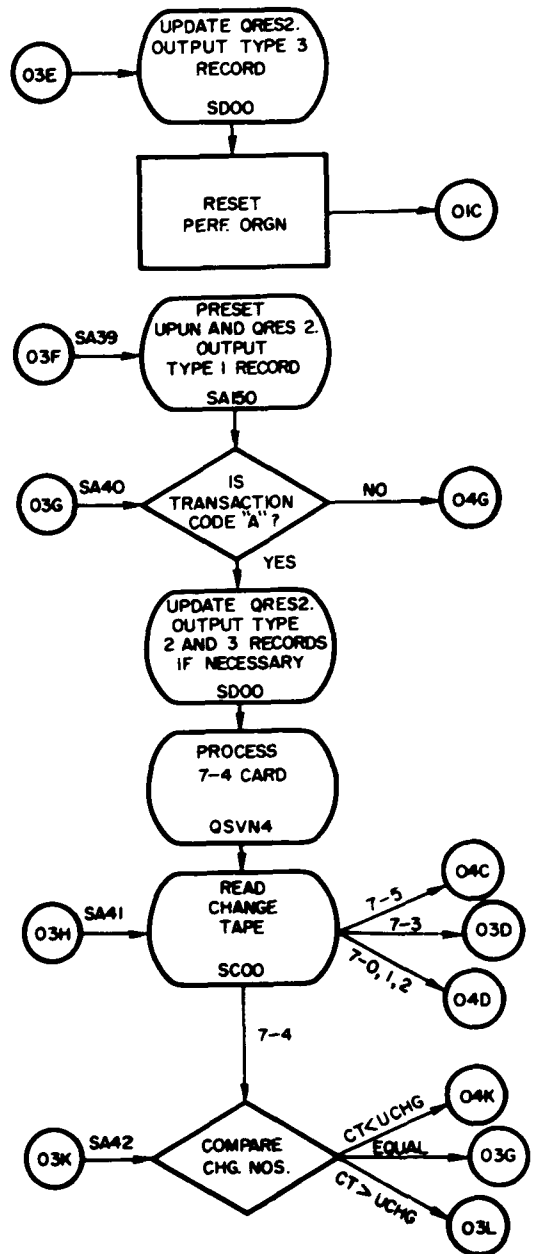
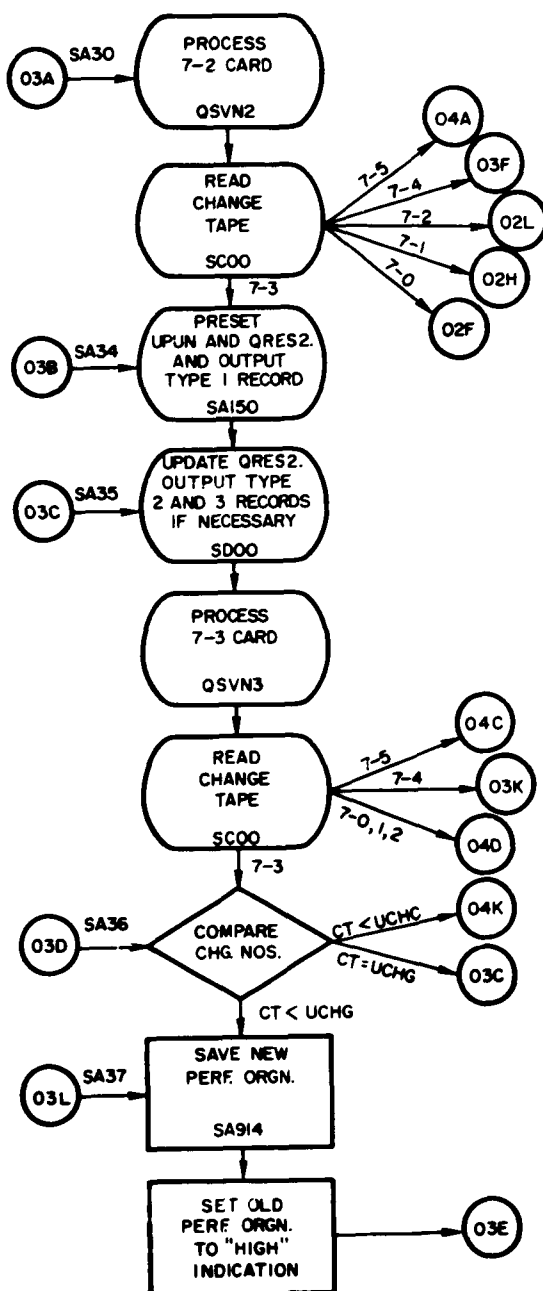
### EXPLANATION OF CALLING SEQUENCE:

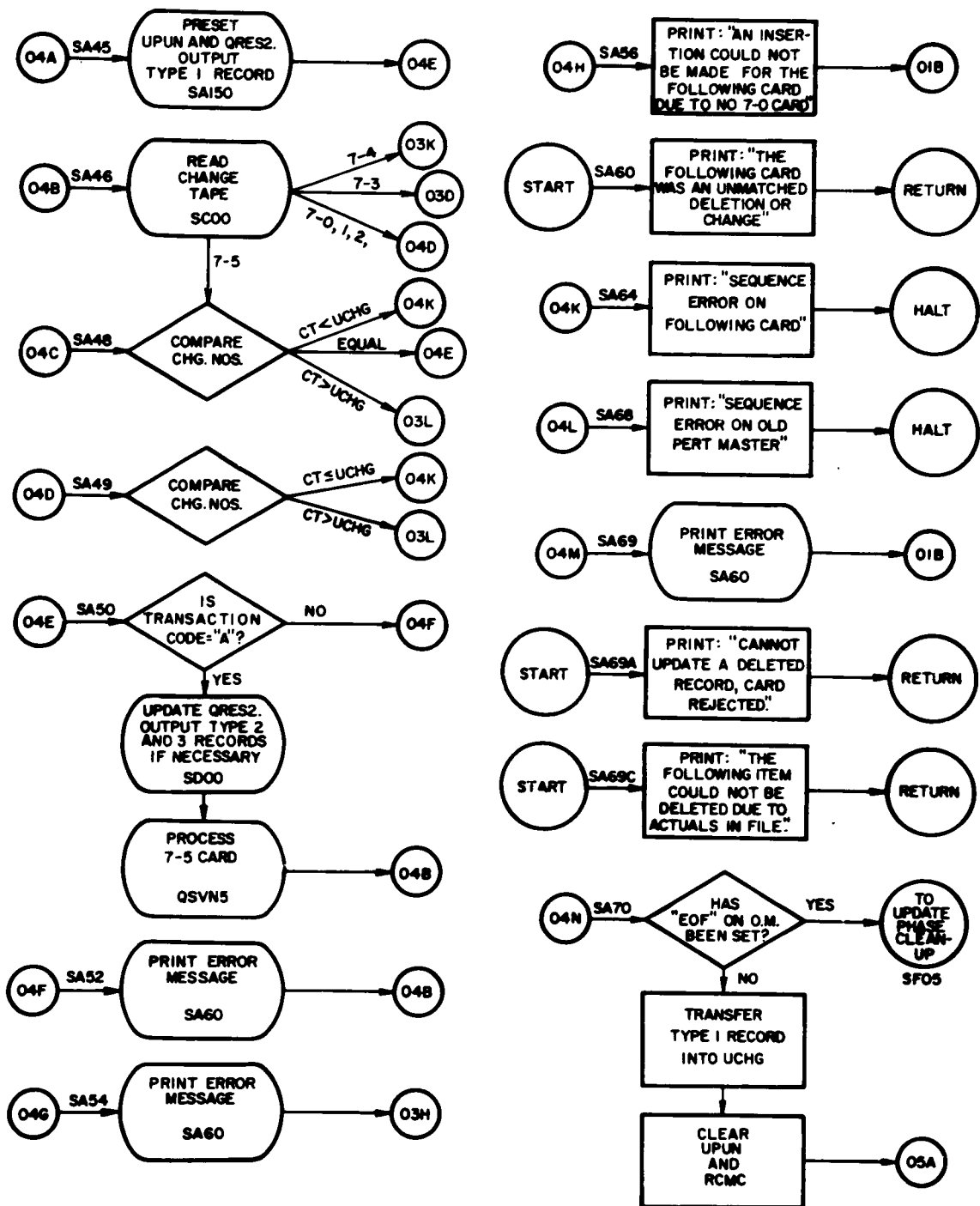
When all of the inputs are at end-of-file the program will transfer control out of the update into the 4-tape sort for preliminary sort on output data.

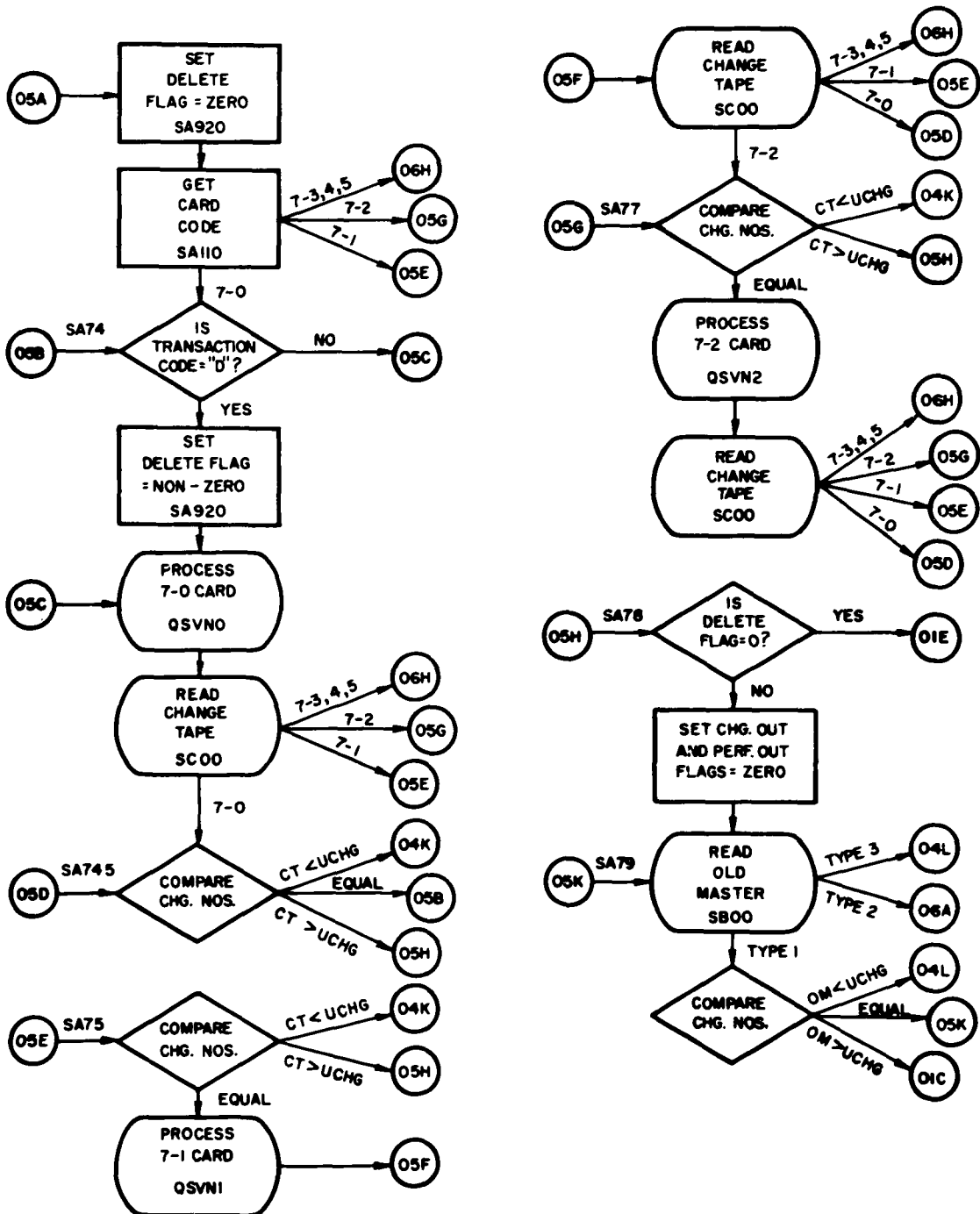
The locations PUAO and SA00 are equal.





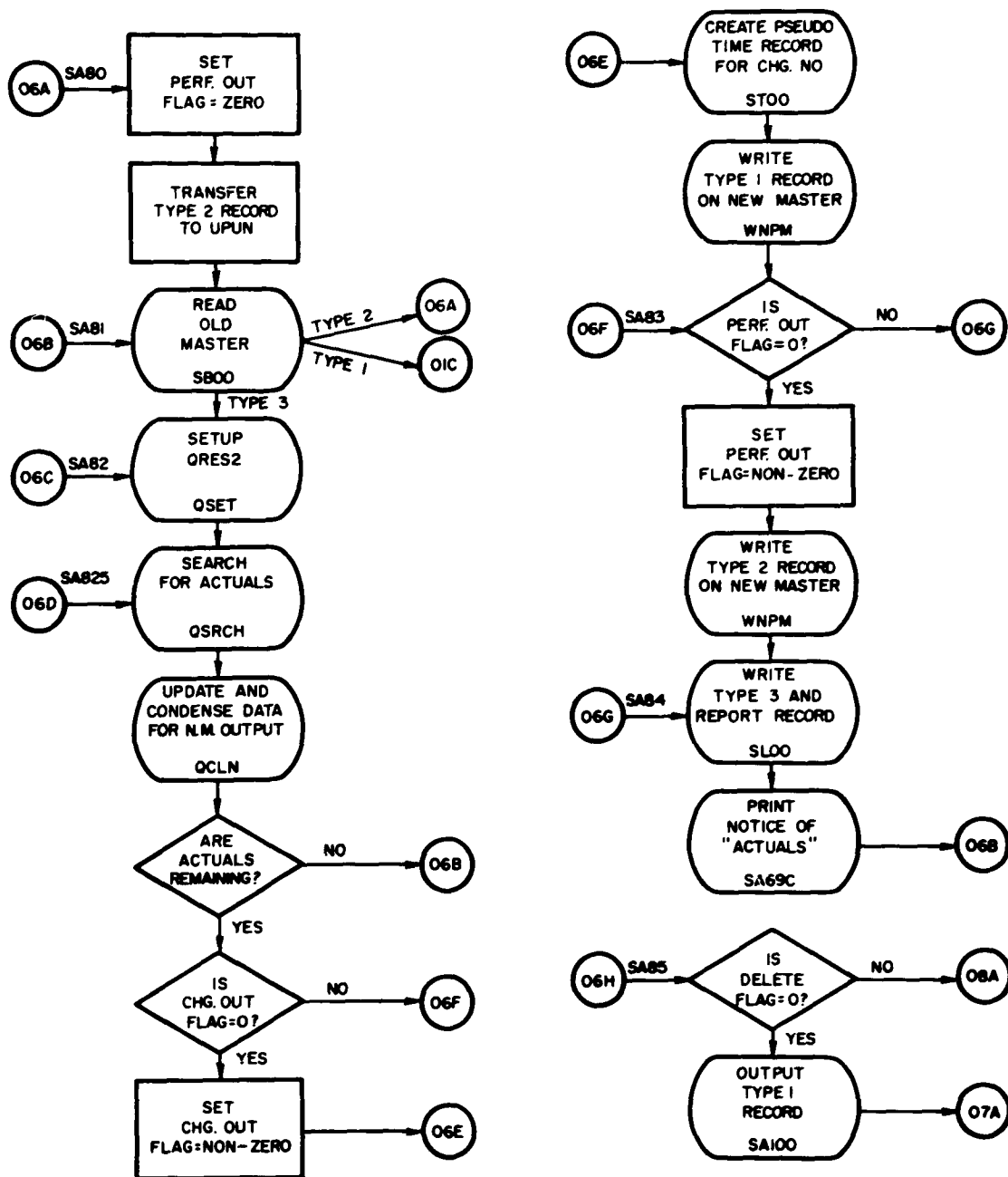


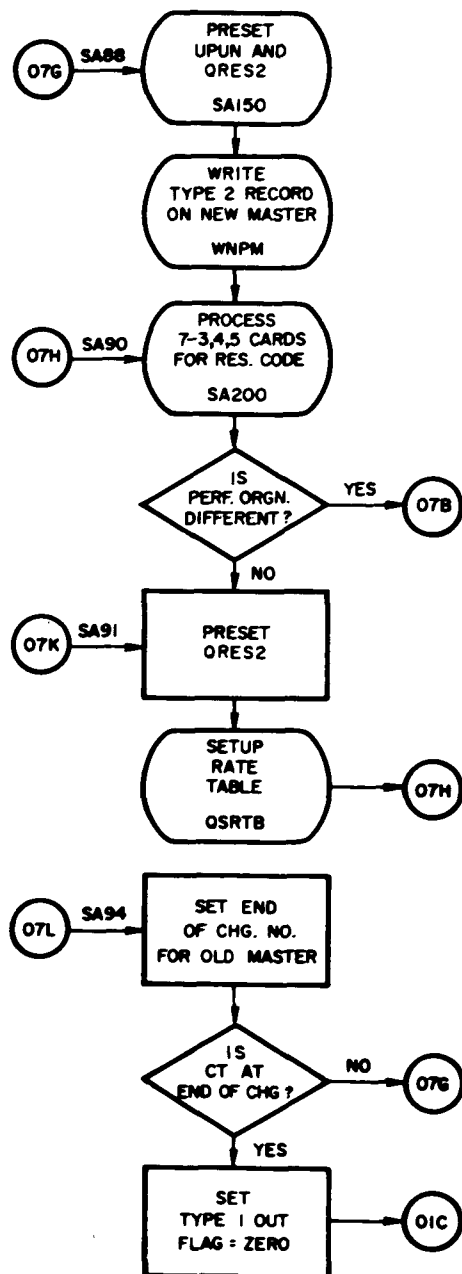
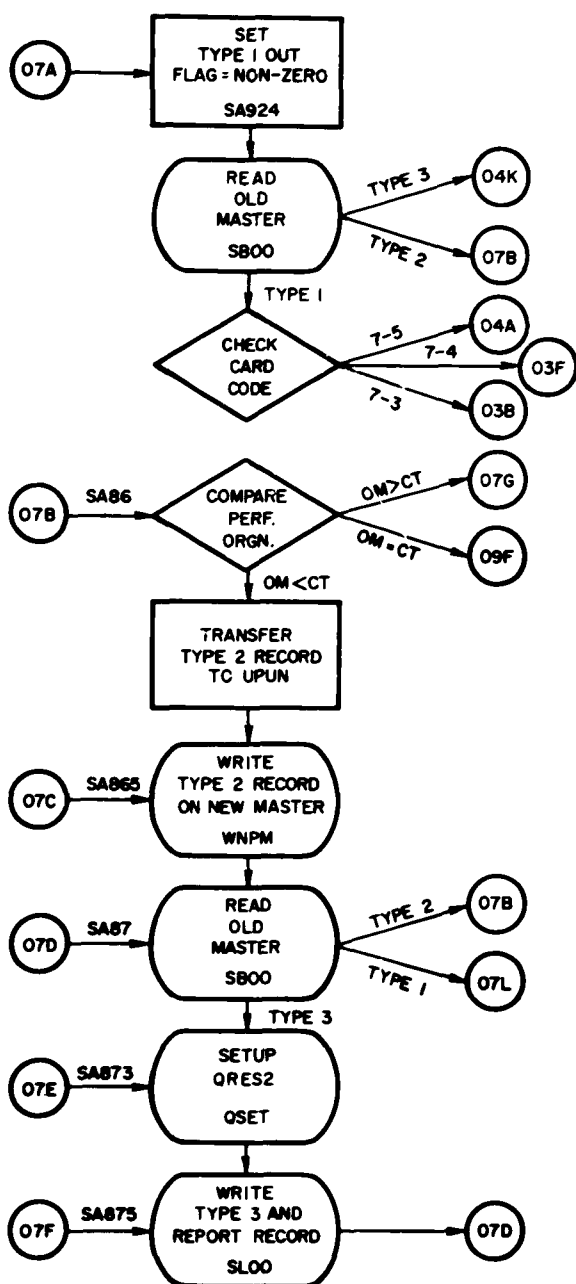




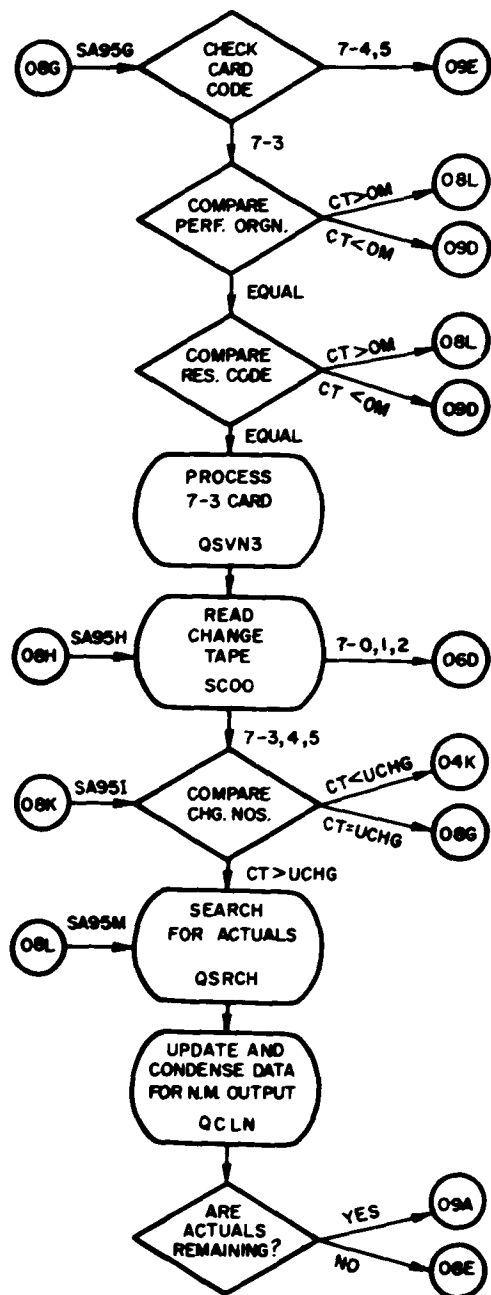
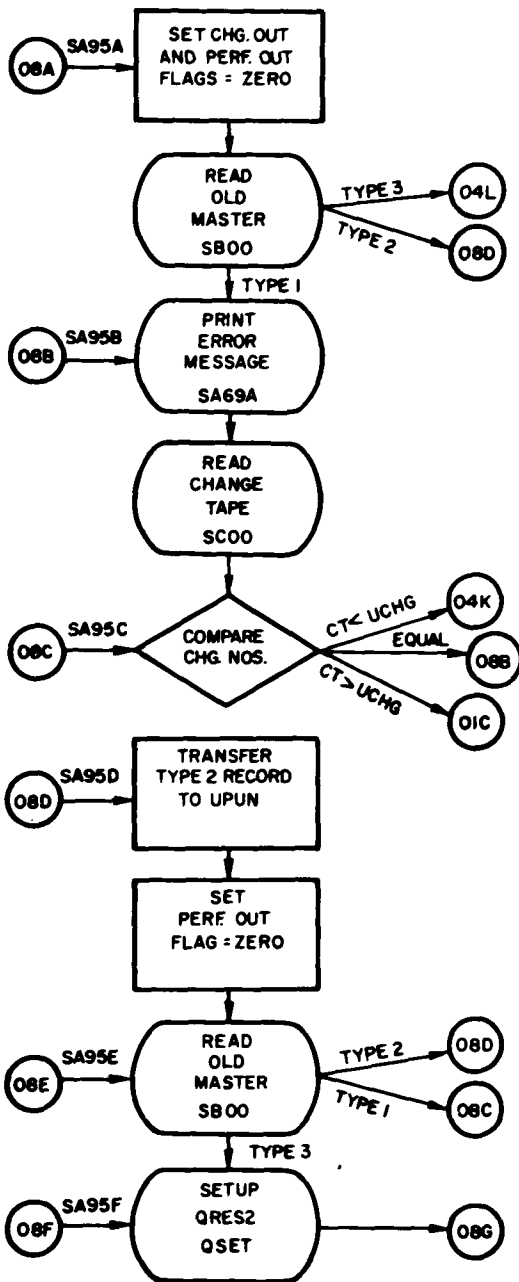


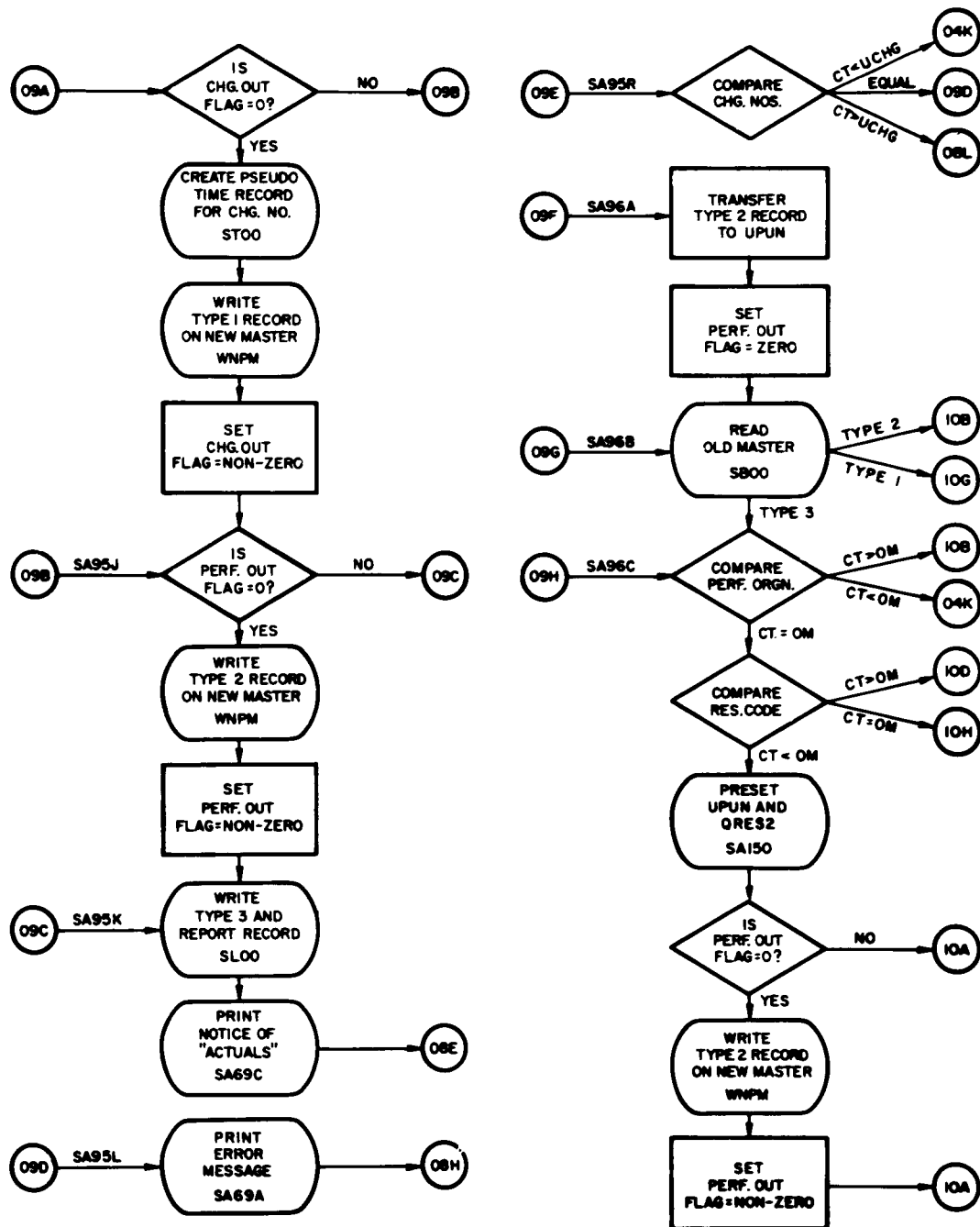
REGION PUAO

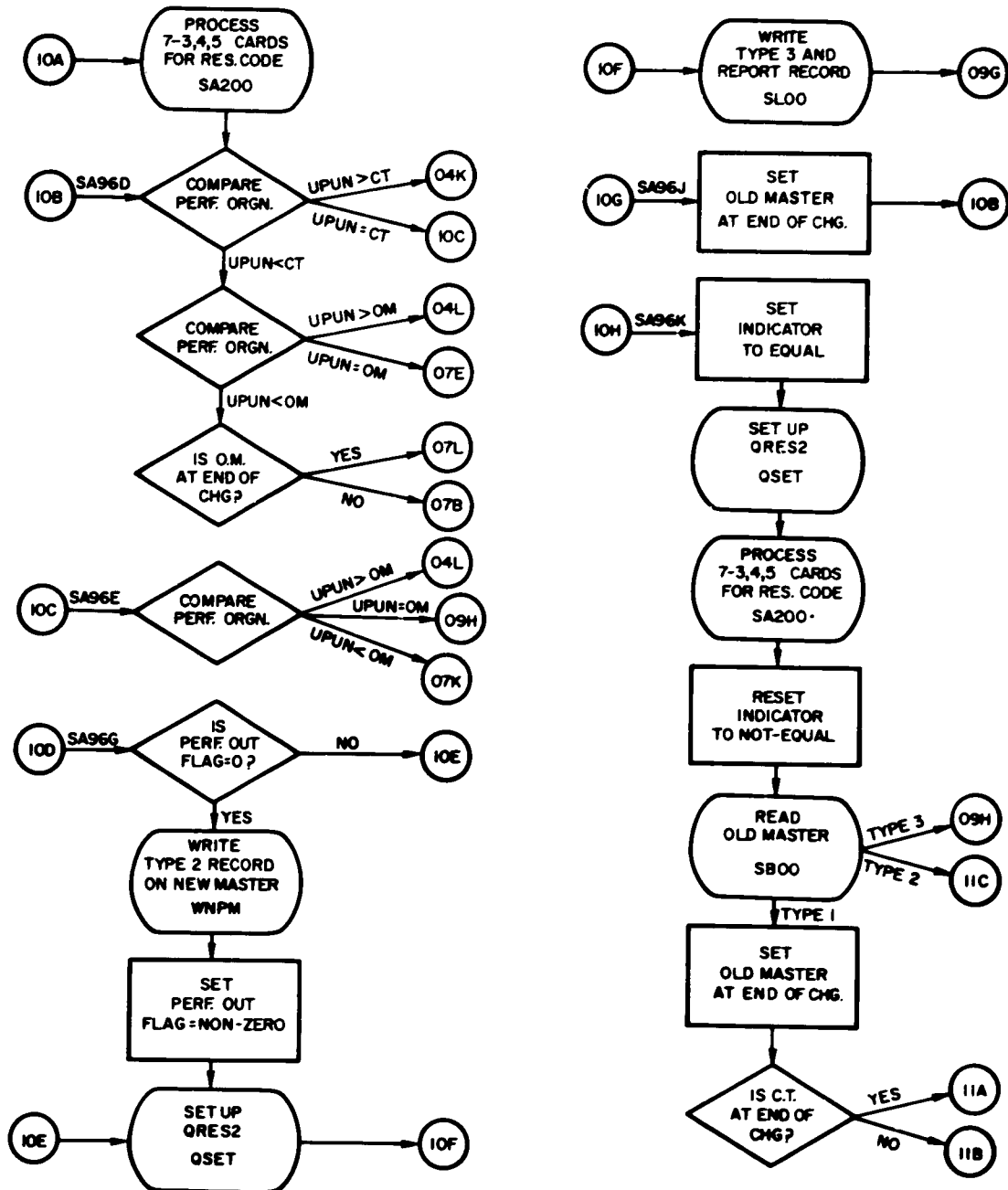


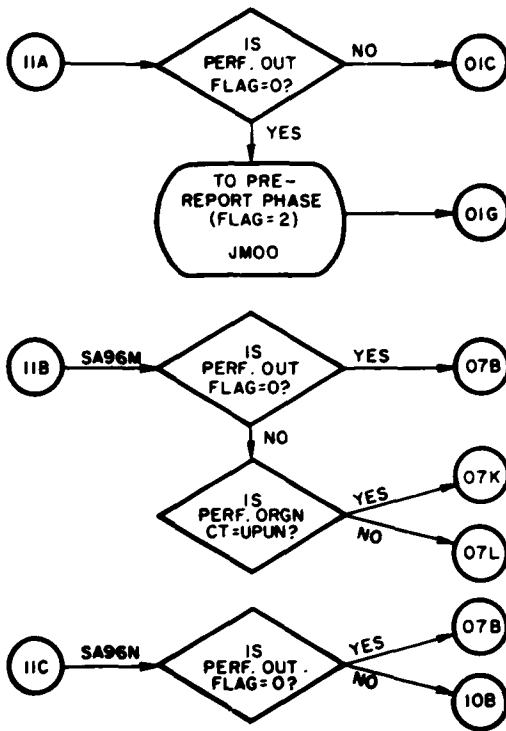


REGION PUAO



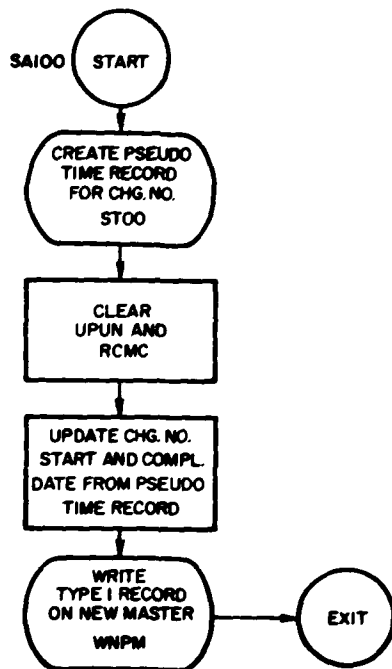




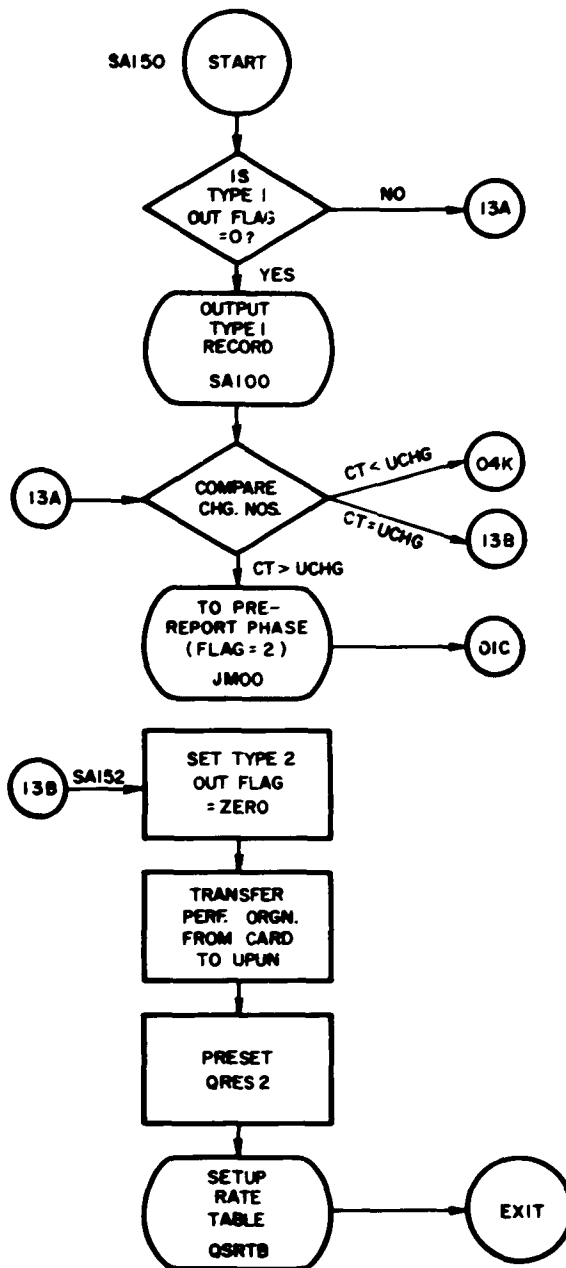


REGION PUAO  
SUBREGION SAIOO

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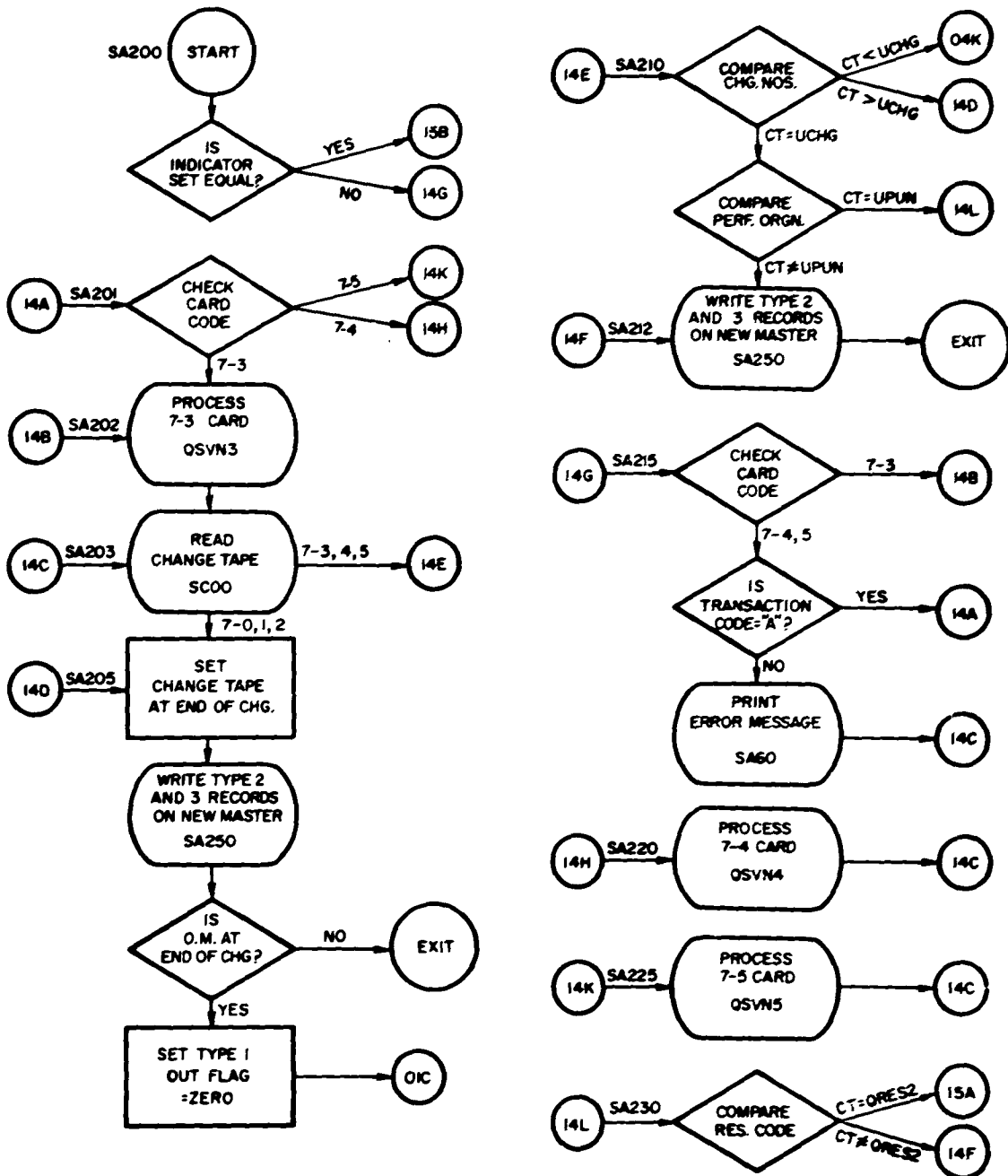


REGION PUAO  
SUBREGION SA150



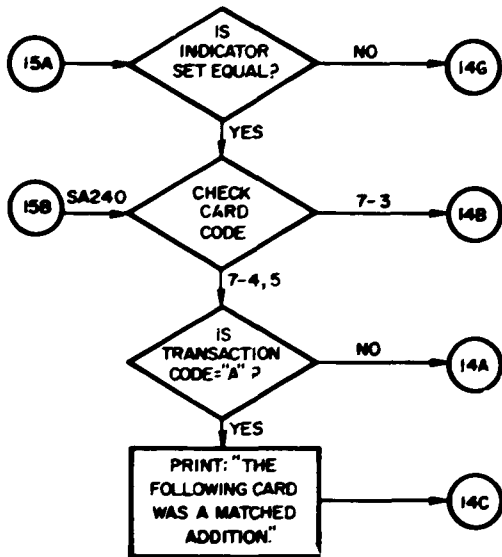


REGION PUAO  
SUBREGION SA200

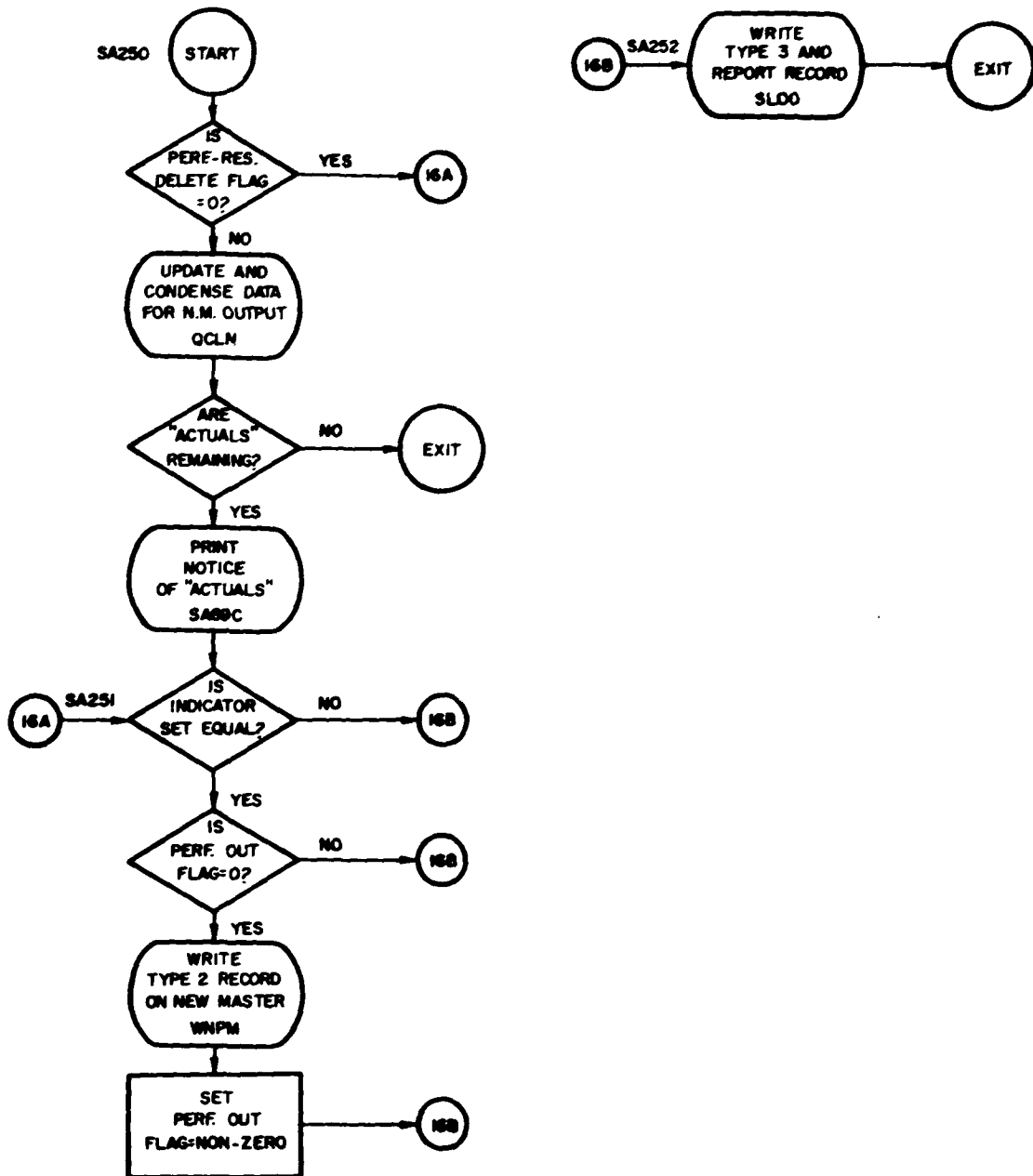


REGION PUAO  
SUBREGION SA200

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REGION PUAO  
SUBREGION SA250



Region SB00

**EXPLANATION OF REGION:**

To read a record from the OLD PERT COST MASTER FILE

**CALLING SEQUENCE:**

L       TSX   SB00, 4  
L + 1   Exit   with Type 3 record  
L + 2   Exit   with Type 2 record  
L + 3   Exit   with Type 1 record or end-of-file\*

**INPUT:**

OLD PERT COST MASTER FILE

**OUTPUT:**

SA901 = Location of record in address, count in decrement.  
If Type 1, charge number in SA904 (3 words)  
If Type 2, performing organization in SA904+3 (1 word)  
If Type 3, resource code in SA904+4 (1 word)

**STORAGE USED:**

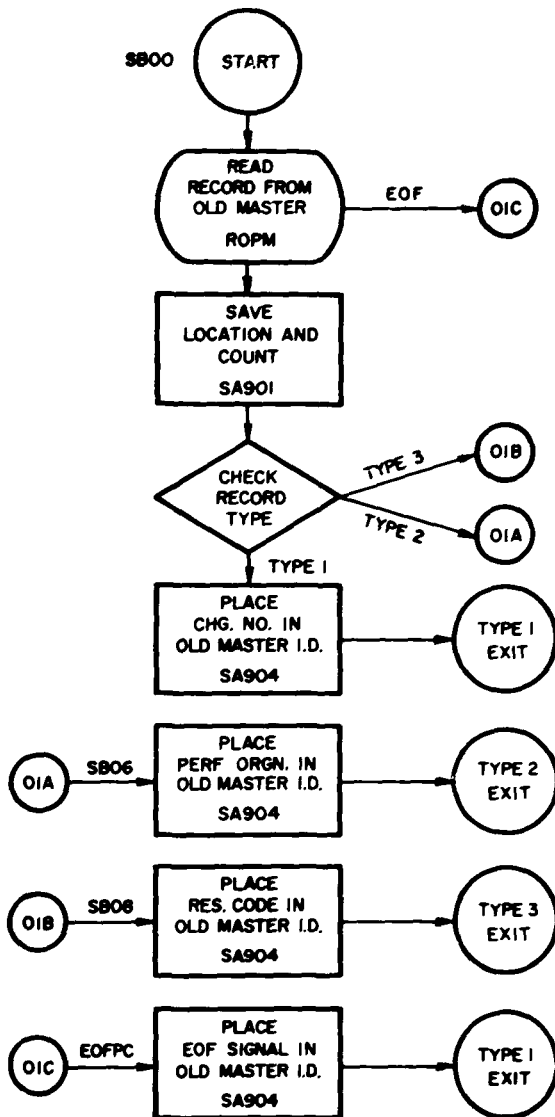
Not applicable

**SUBREGIONS AND SUBROUTINES USED:**

ROPM

**EXPLANATION OF CALLING SEQUENCE:**

\* If end-of-file, SA904 contains 3 words of octal 7's.



Region SC00

EXPLANATION OF REGION:

To read one card from the SORTED DATA TAPE.

CALLING SEQUENCE:

L       TSX   SC00, 4  
L + 1   Exit   with Type 75 card  
L + 2   Exit   with Type 74 card  
L + 3   Exit   with Type 73 card  
L + 4   Exit   with Type 72 card  
L + 5   Exit   with Type 71 card  
L + 6   Exit   with Type 70 card or end-of-file#

INPUT:

SORTED DATA TAPE

OUTPUT:

CHHLD   = Location of card in address, count in decrement  
SA905    = Charge number (3 words)  
SA905+3   = Performing organization (1 word) } type 73, 74, 75  
SA905+4   = Resource code (1 word)         } cards only  
UP451+1 - UP451+80 contains card image, one character per word

STORAGE USED:

Not applicable.

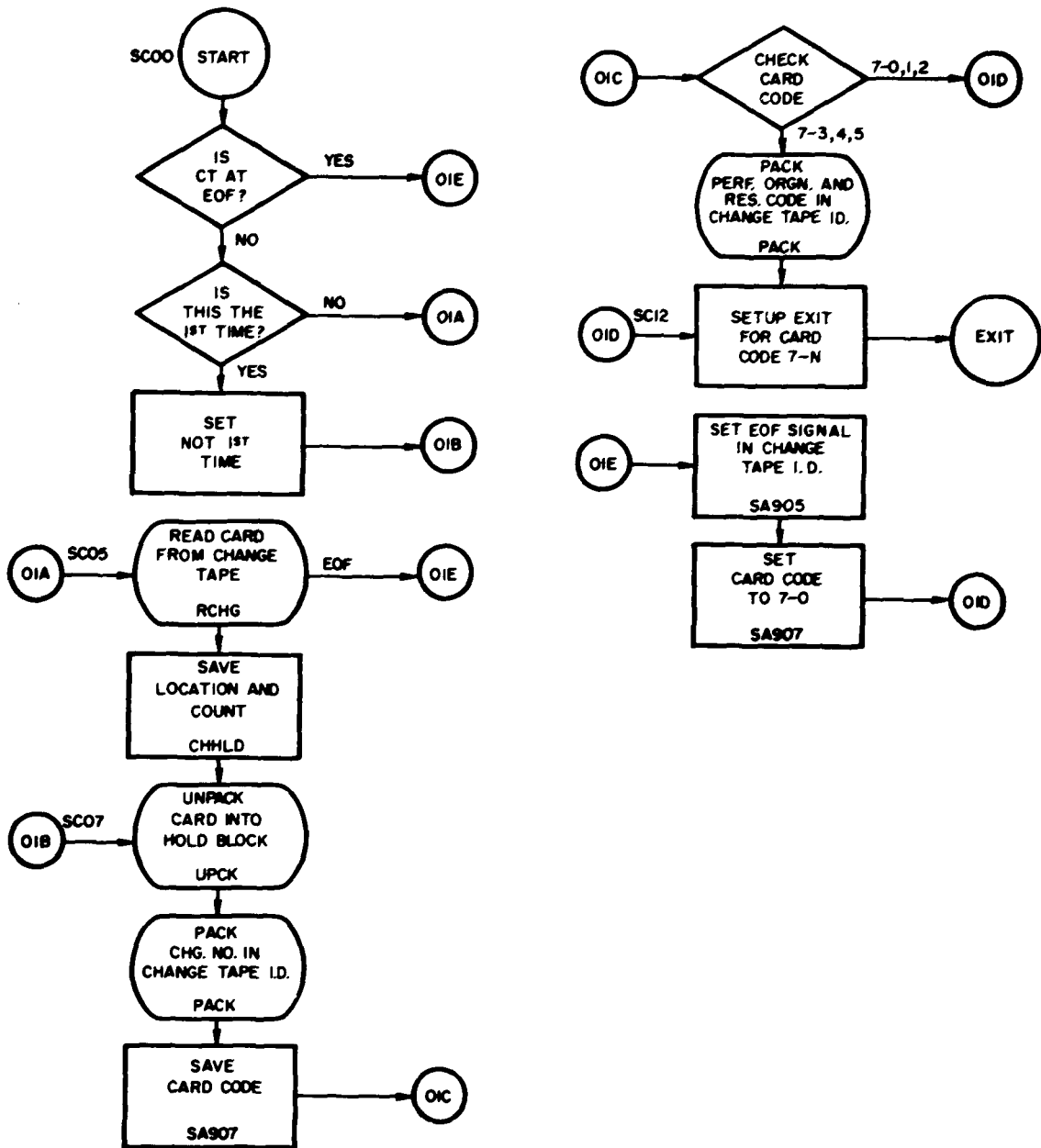
SUBREGIONS AND SUBROUTINES USED:

RCHG  
UPCK  
PACK

EXPLANATION OF CALLING SEQUENCE:

If end of file, SA905 contains 5 words of octal 7's and CHHLD = 0.

REGION SC00



Region SD00

**EXPLANATION OF REGION:**

To write performing organization and resource code records on NEW PERT COST MASTER FILE and give one charge number, performing organization, resource code item to pre-reporting control routine.

**CALLING SEQUENCE:**

L       TSX   SD00, 4  
L + 1   Normal return

**INPUT:**

Performing organization in UPUN (2 words)  
Resource code in ORES2 (N words, 600 max)

**OUTPUT:**

Type 2 and 3 records on NEW PERT COST MASTER  
One CHG-PERF-RES item to pre-reporting (JM00)

**STORAGE USED:**

Not applicable

**SUBREGIONS AND SUBROUTINES USED:**

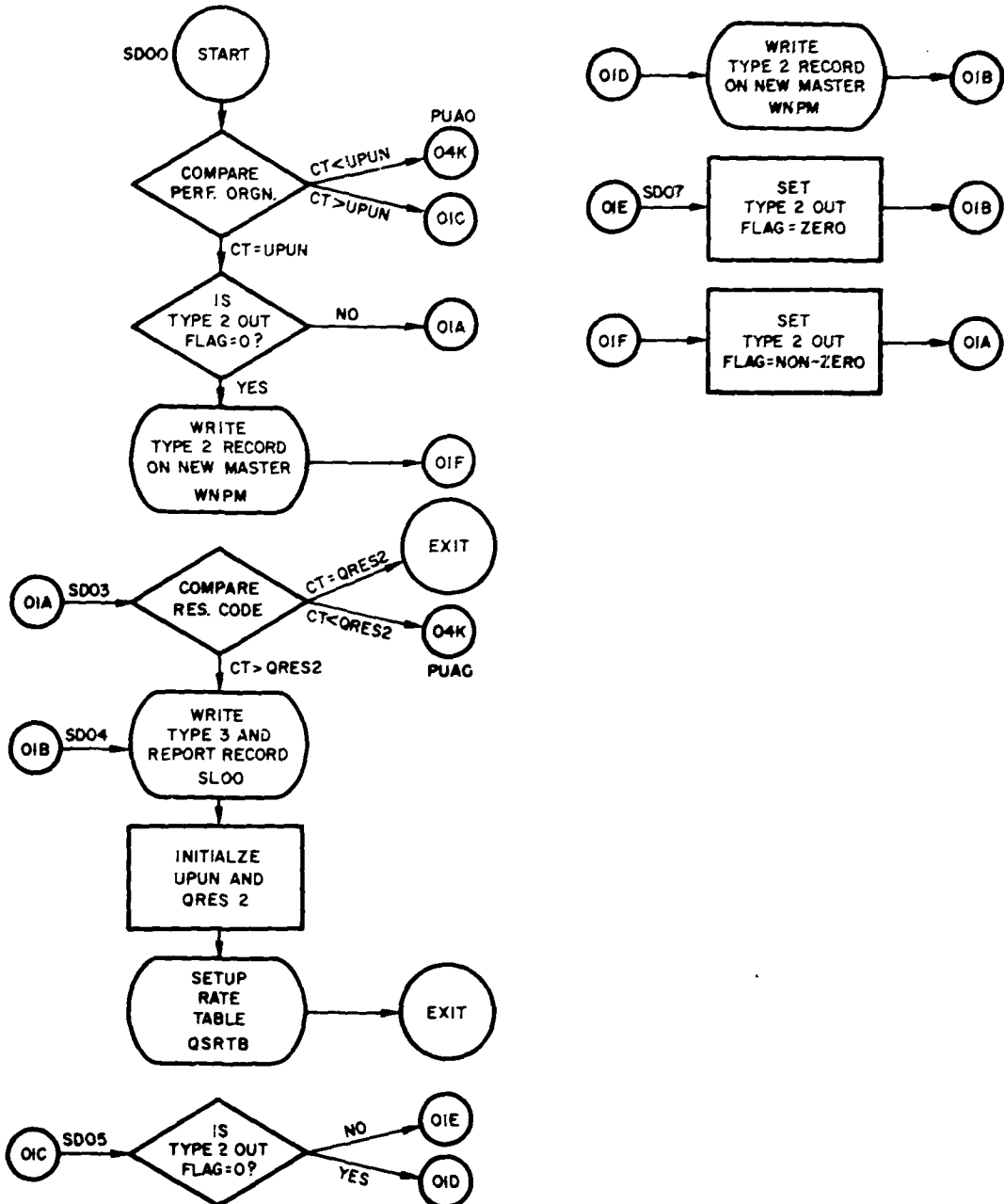
WNPM  
JM00  
QCLN  
QSRTB

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable



REGION SDOO



Region SF00

EXPLANATION OF REGION:

Cleanup of Update phase.

CALLING SEQUENCE:

L TRA SF05

INPUT:

Not applicable

OUTPUT:

End-of-update-phase message.

Exit to cleanup pre-reporting phase.

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

WDNP

ST00

FTB

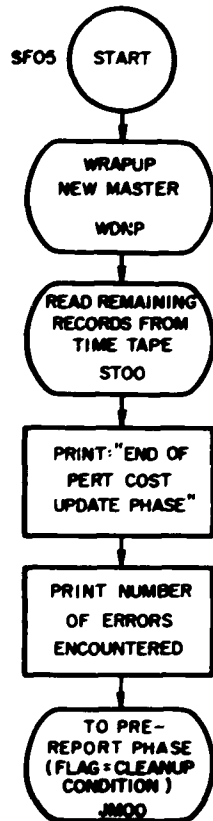
JM00

EXPLANATION OF CALLING SEQUENCE:

Not applicable

REGION SFOO

---



Region ST00

**EXPLANATION OF REGION:**

To read from SORTED TIME TAPE all activities concerned with present charge number and print out activities connected to non-existent charge numbers.

**CALLING SEQUENCE:**

L       TSX   ST00, 4  
L + 1   Normal return

**INPUT:**

UCHG+1 = charge number (3 words)  
SORTED TIME TAPE

**OUTPUT:**

PSEUDO TIME RECORD - UTIME  
Activity records to pre-reporting routine.

**STORAGE USED:**

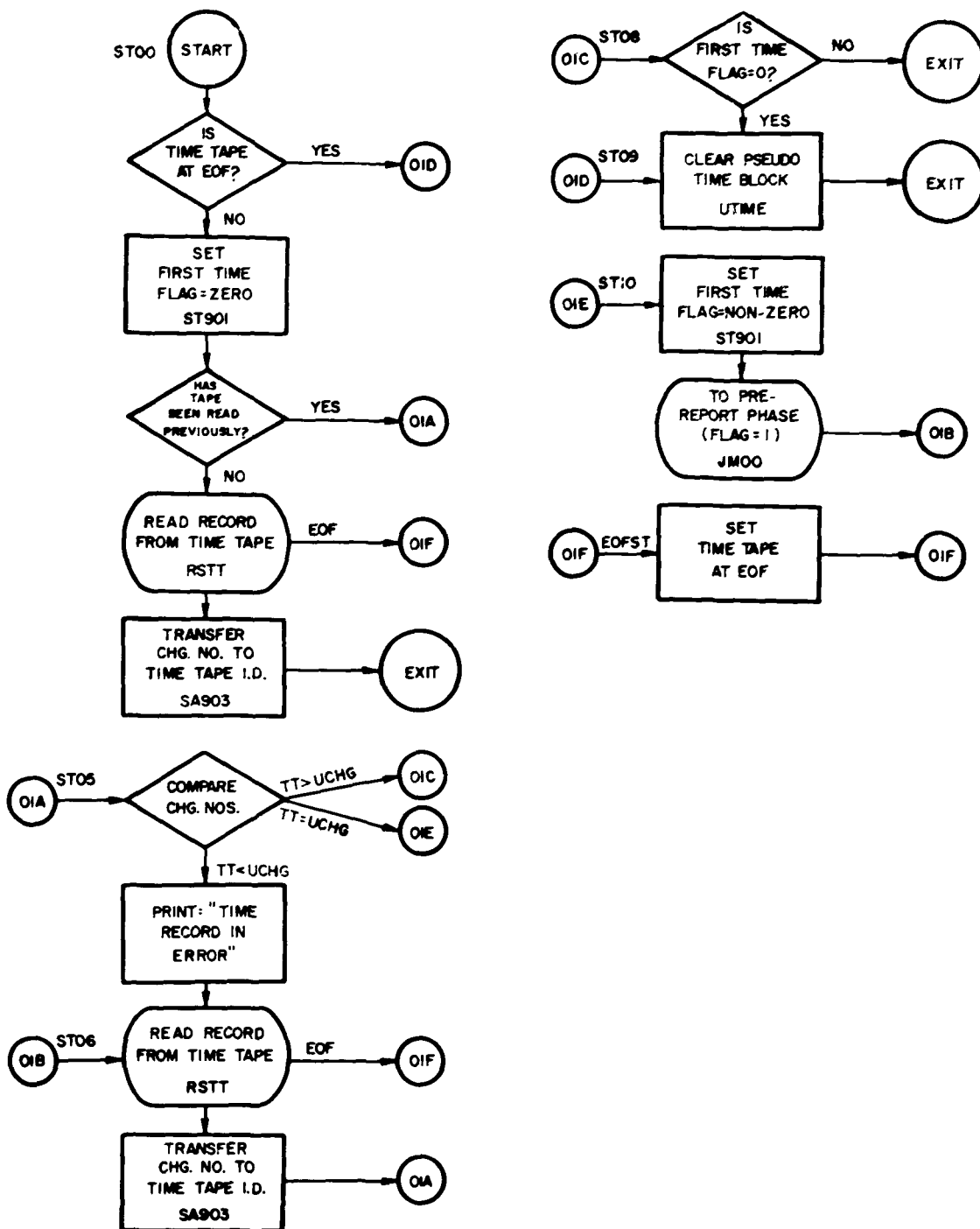
UTIME - 25 words - layout in sec 3.7

**SUBREGIONS AND SUBROUTINES USED:**

JM00  
RSTT

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable



Region SL00

**EXPLANATION OF REGION:**

To write out Resource Code record on the new Master File, extend the costs thru the Rate Table, and write a Charge No. , Performing Organization, Resource Code record on the Report Tape.

**CALLING SEQUENCE:**

L     TSX   SL00, 4  
L+1   Normal return

**INPUT:**

Information:   UCHG   - charge No.  
                  UPUN   - performing organization  
                  RBUF2 - resource code (unextended costs)  
                  UTIME - pseudo time

**OUTPUT:**

1.     Resource Code record on the New Master File
2.     Report record on the Report Tape

**STORAGE USED:**

RBUF1 - resource code (extended costs)

**SUB-REGIONS AND SUBROUTINES USED:**

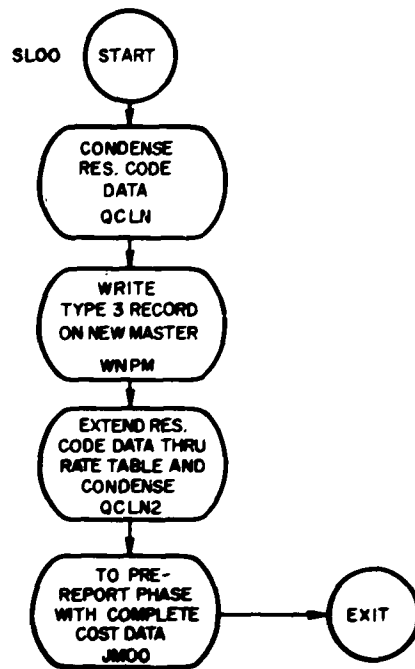
QCLN           JM00  
WNPM  
QCLN2

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.

REGION SLOO

---



### Region QSET

#### EXPLANATION OF REGION:

This routine will set up the rate table for the resource code being operated upon, as well as set up QRES2 with the resource code data cleared of the rate table extensions from the previous cycle.

#### CALLING SEQUENCE:

L       TSX   QSET, 4  
L + 1   Location of resource code record in PTBF5 or PTBF6  
L + 2   Normal return

#### INPUT:

Record in PTBF5 or PTBF6 from OLD SECONDARY MASTER.

#### OUTPUT:

A resource code record that has been cleared of all rate extensions, located in an unpacked format in QRES2.

#### STORAGE USED:

QRES2 - 600 words - unpacked resource code block.

#### SUBREGIONS AND SUBROUTINES USED:

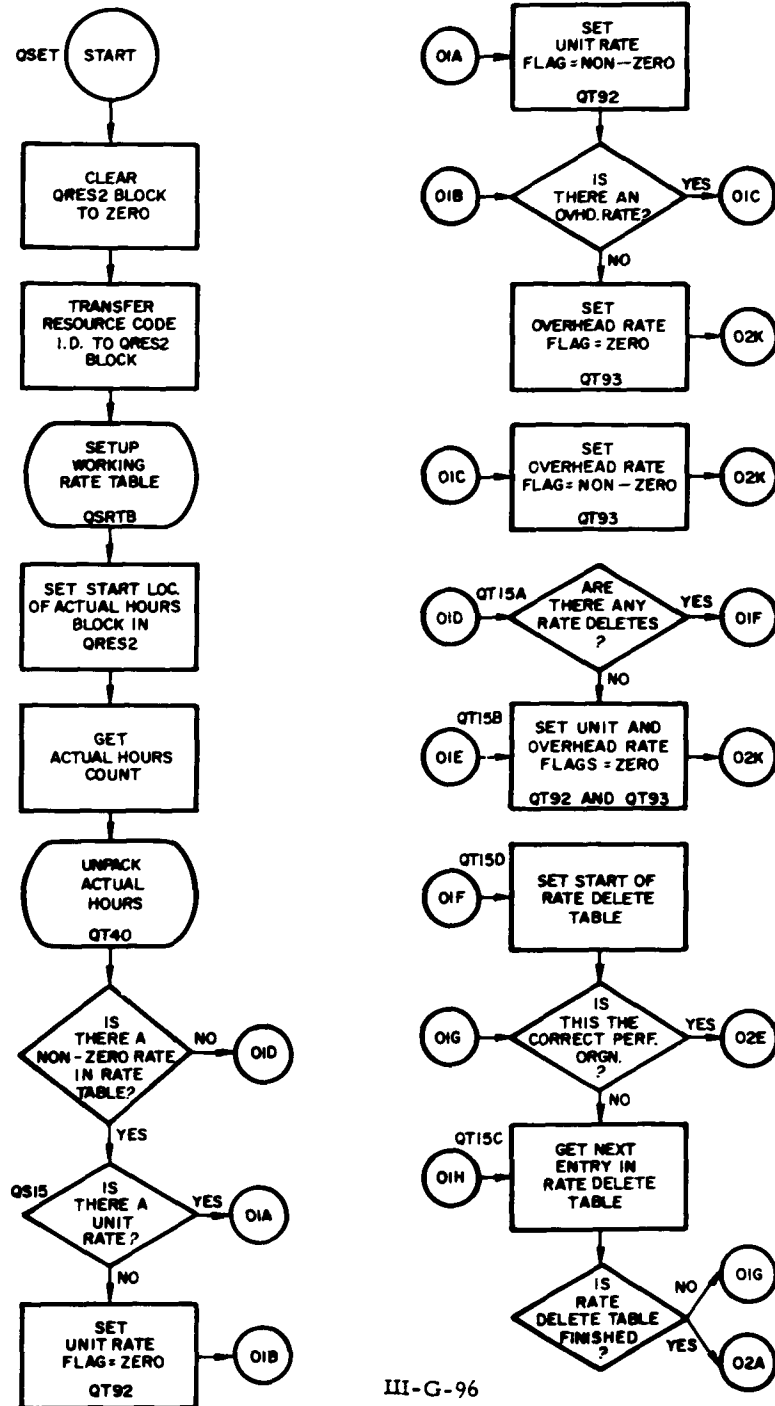
QSRTB

#### EXPLANATION OF CALLING SEQUENCE:

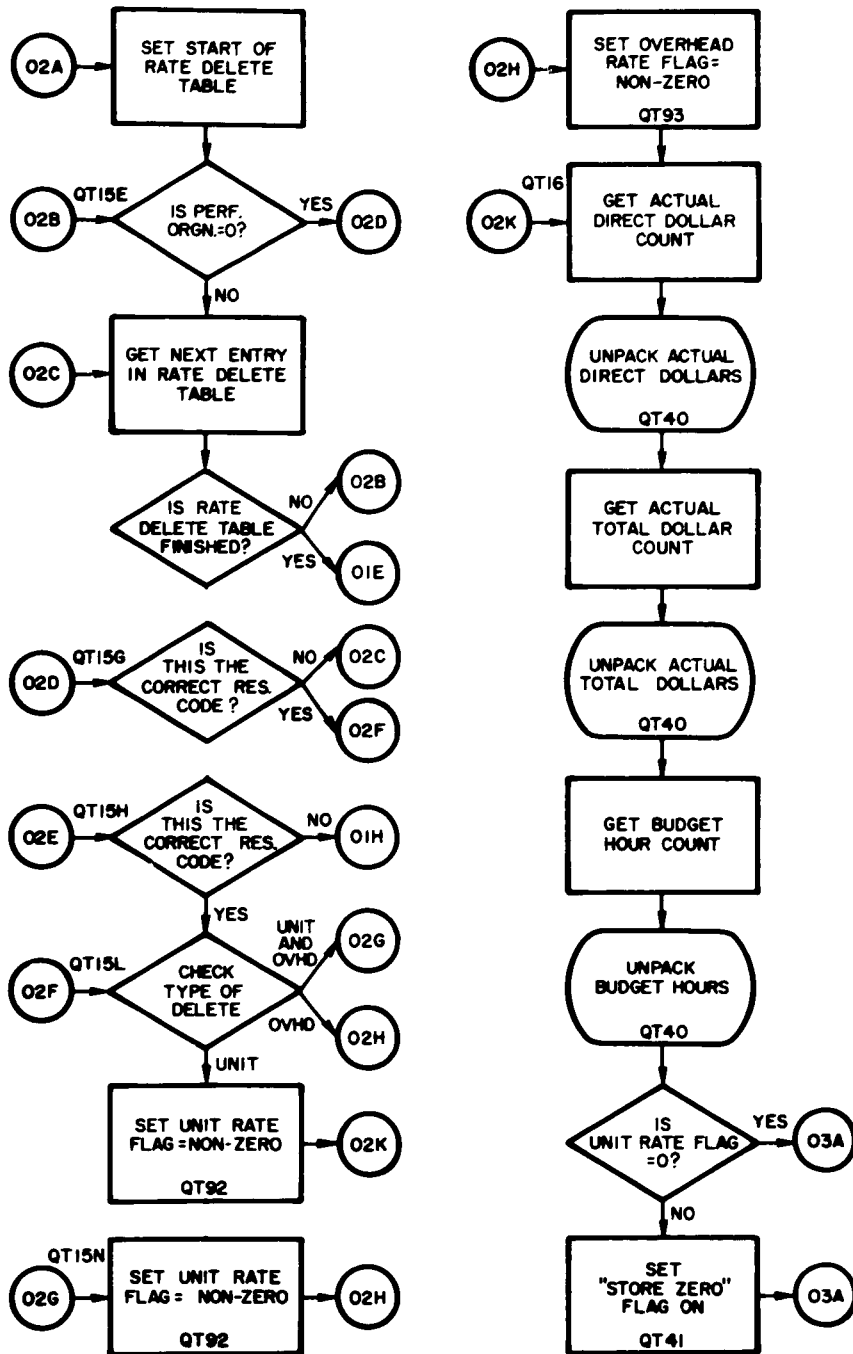
Not applicable

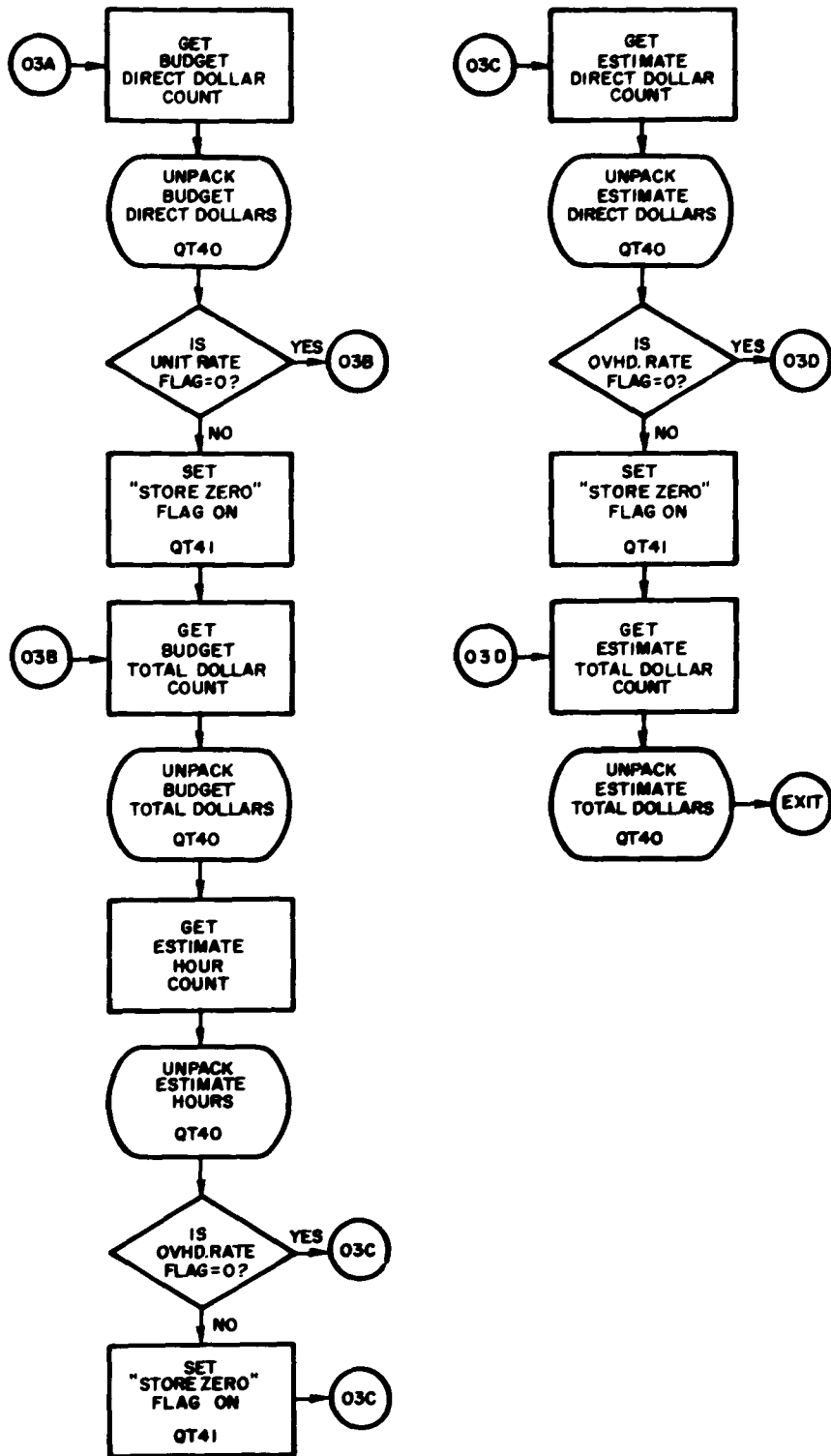


# REGION QSET



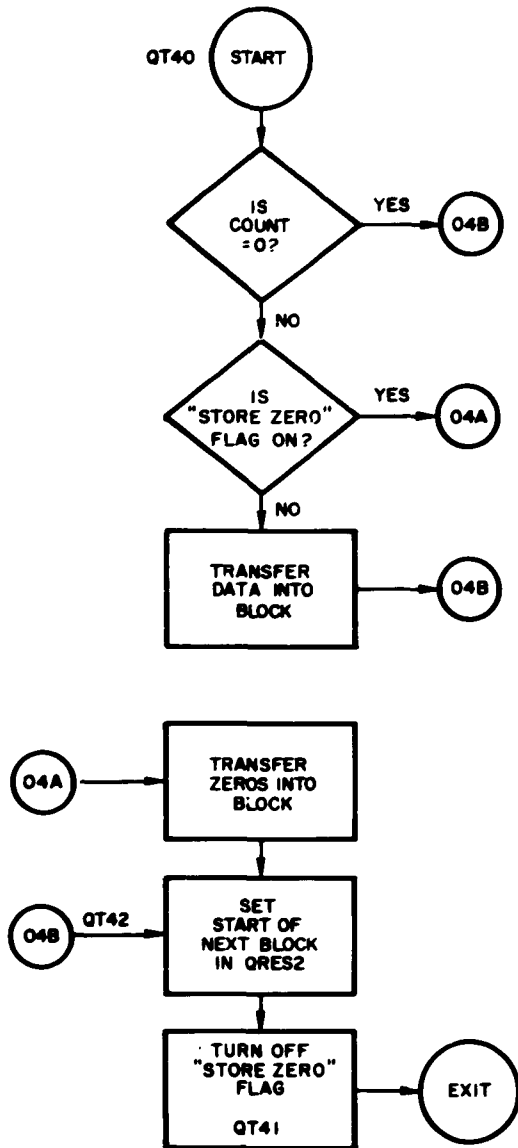
REGION QSET





REGION QSET  
SUBREGION QT40

---



### Region QSRCH

#### EXPLANATION OF REGION:

This routine will delete all of the estimates and budgets, hours or units, and direct dollars and total dollars from the QRES2 table.

#### CALLING SEQUENCE:

L       TSX   QSRCH, 4  
L + 1   Normal return

#### INPUT:

Resource code record set into QRES2.

#### OUTPUT:

Resource code record in QRES2 without any budget or estimate values.

#### STORAGE USED:

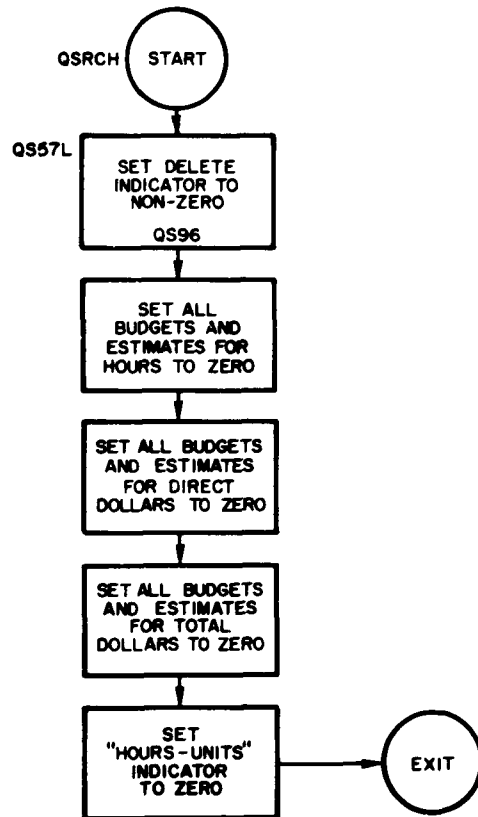
Not applicable.

#### SUBREGIONS AND SUBROUTINES USED:

Not applicable.

#### EXPLANATION OF CALLING SEQUENCE:

Not applicable.



### Region QCLN

#### EXPLANATION OF REGION:

This routine will set up the rainbow and cost category record and will extend the budget and estimate hours (and direct dollars, where applicable) by the rate table. It will also move and pack the resource code record into QRES1..

#### CALLING SEQUENCE:

L       TSX   QCLN  
L+1     Normal return

#### INPUT:

The resource code record in QRES2..

#### OUTPUT:

An extended resource code record in QRES1 in a packed format and the count of the number of words in this resource code record less the indicative information.

The rainbow and cost category record in RCMC

#### STORAGE USED:

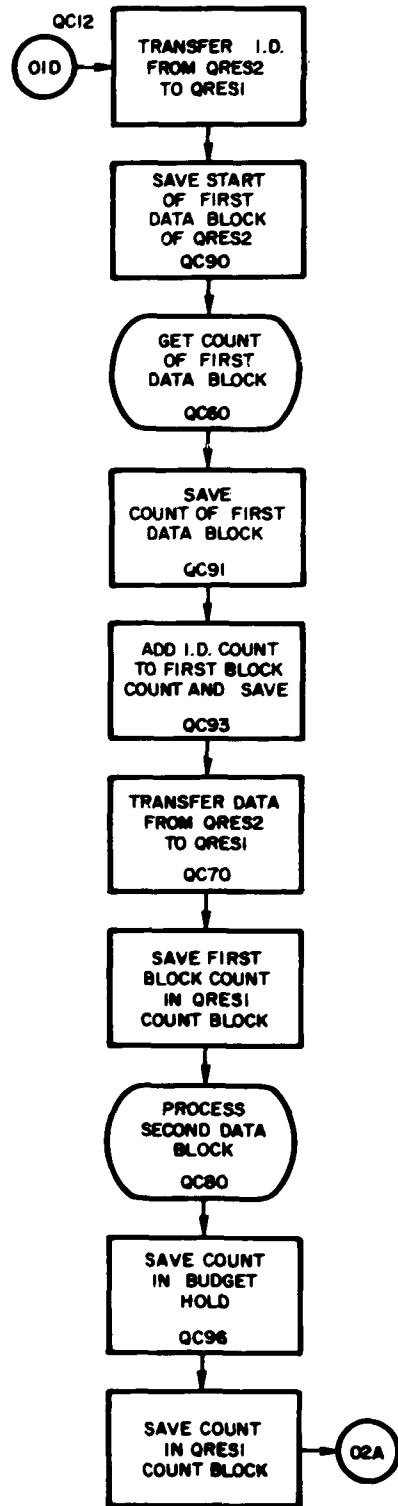
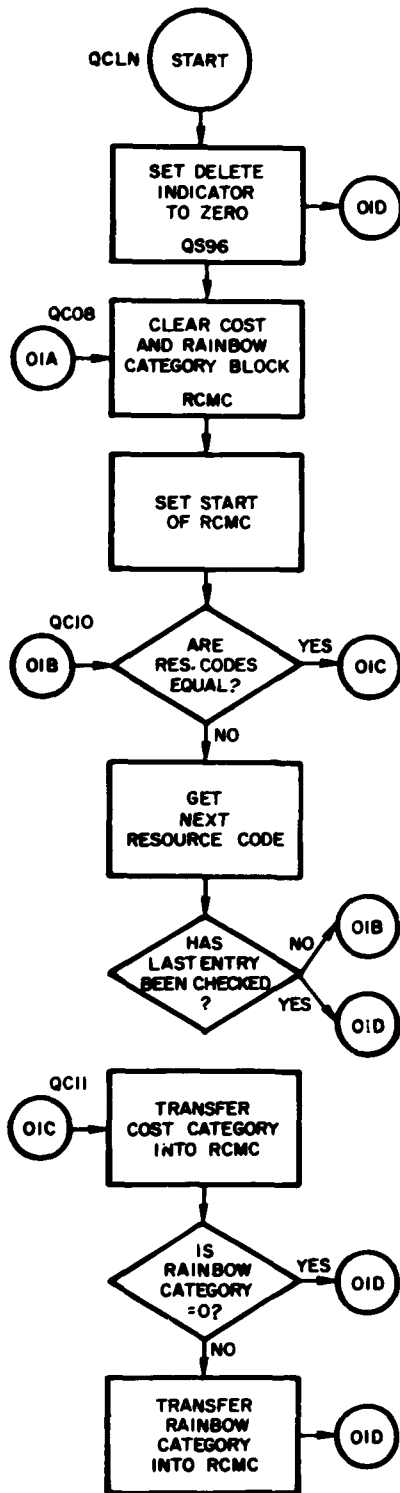
QRES1 - 600 words - packed resource code record.

#### SUBREGIONS AND SUBROUTINES USED:

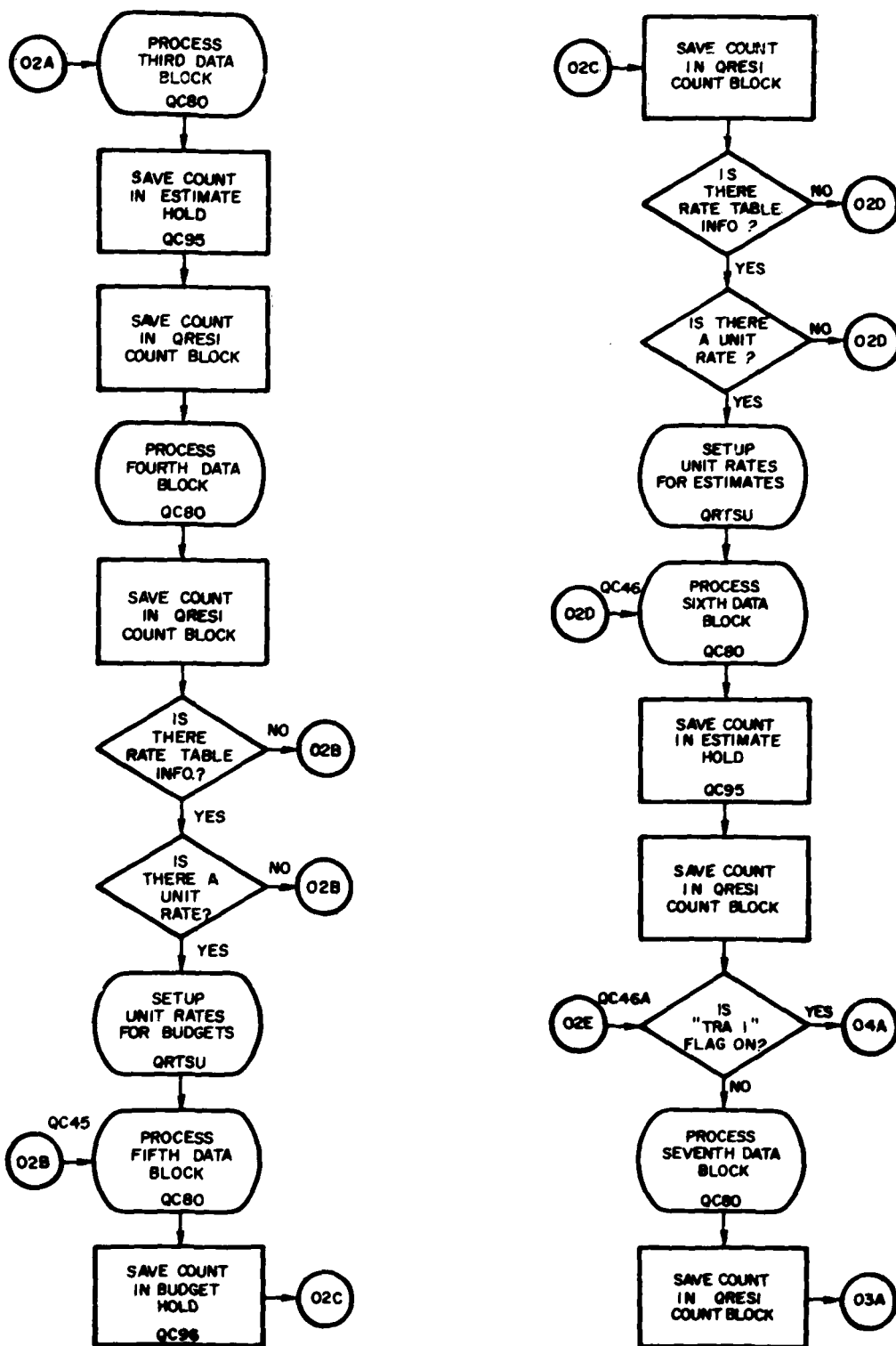
Not applicable.

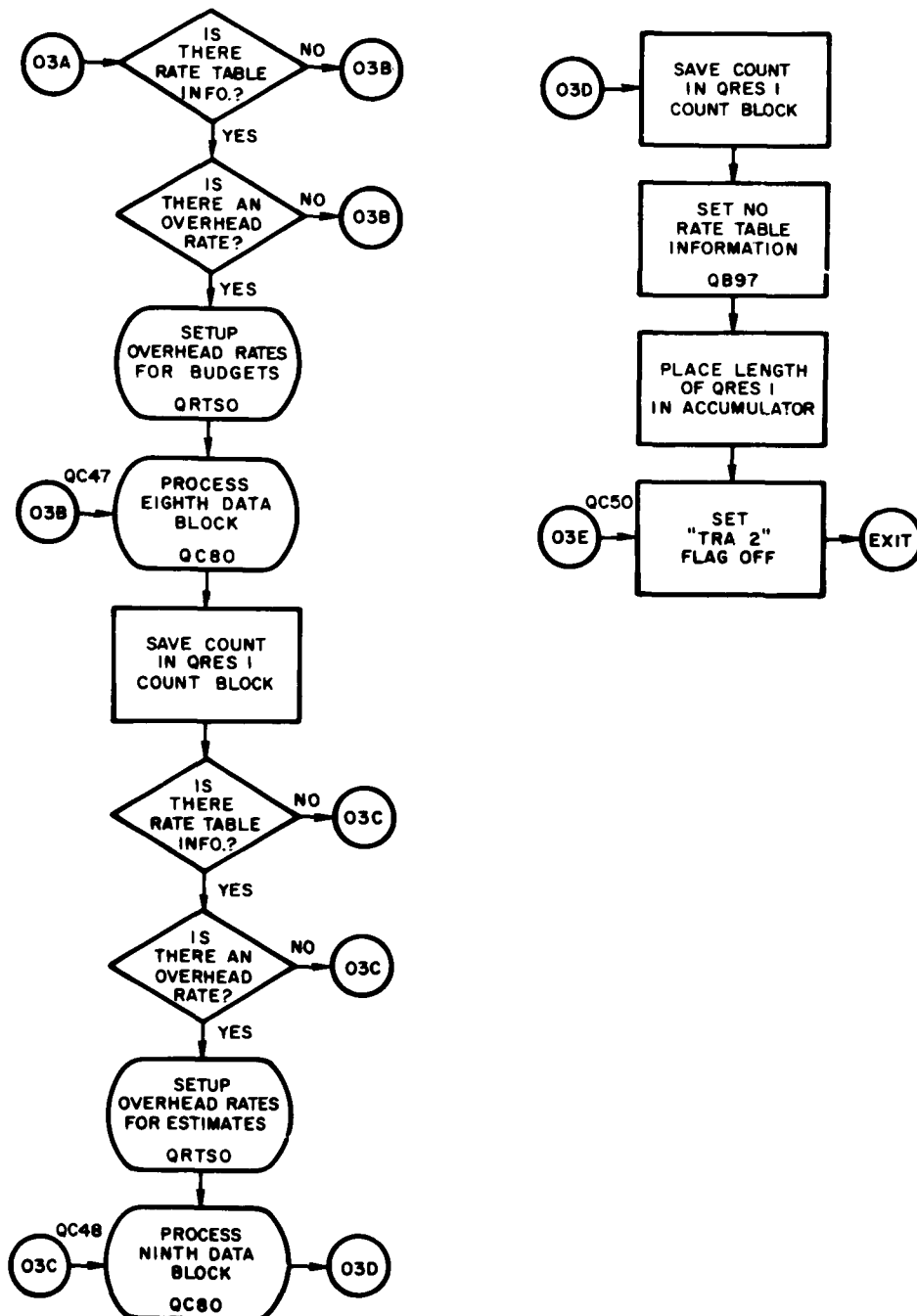
#### EXPLANATION OF CALLING SEQUENCE:

Not applicable.

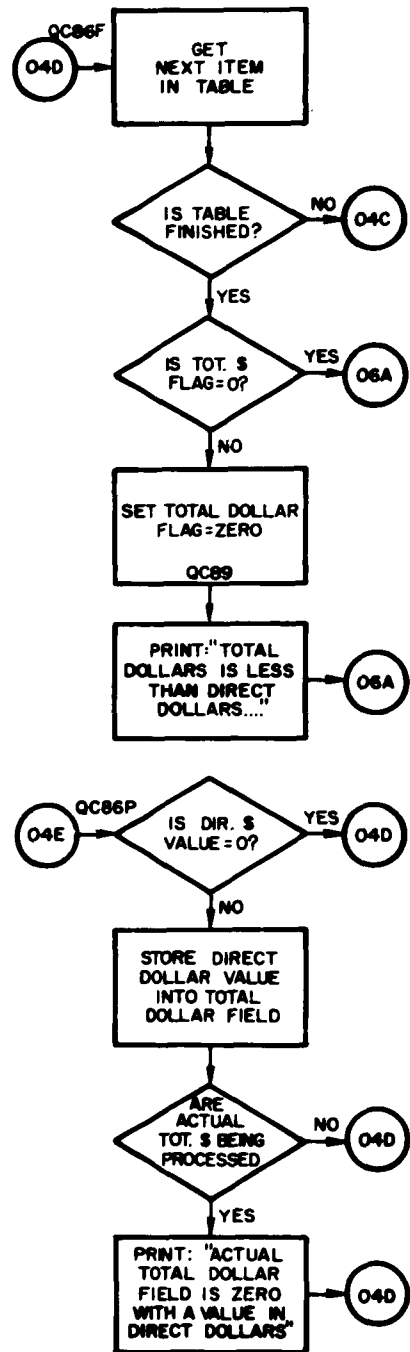
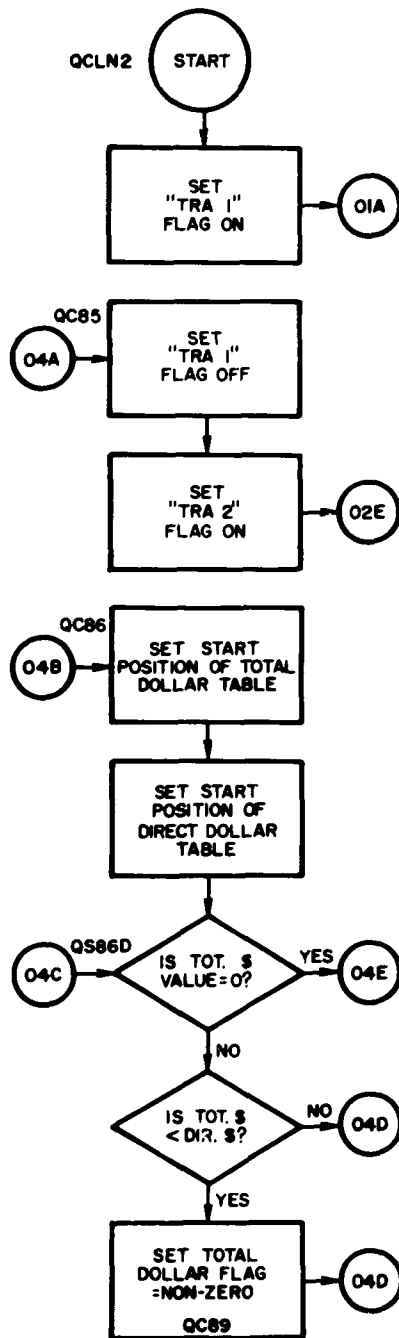


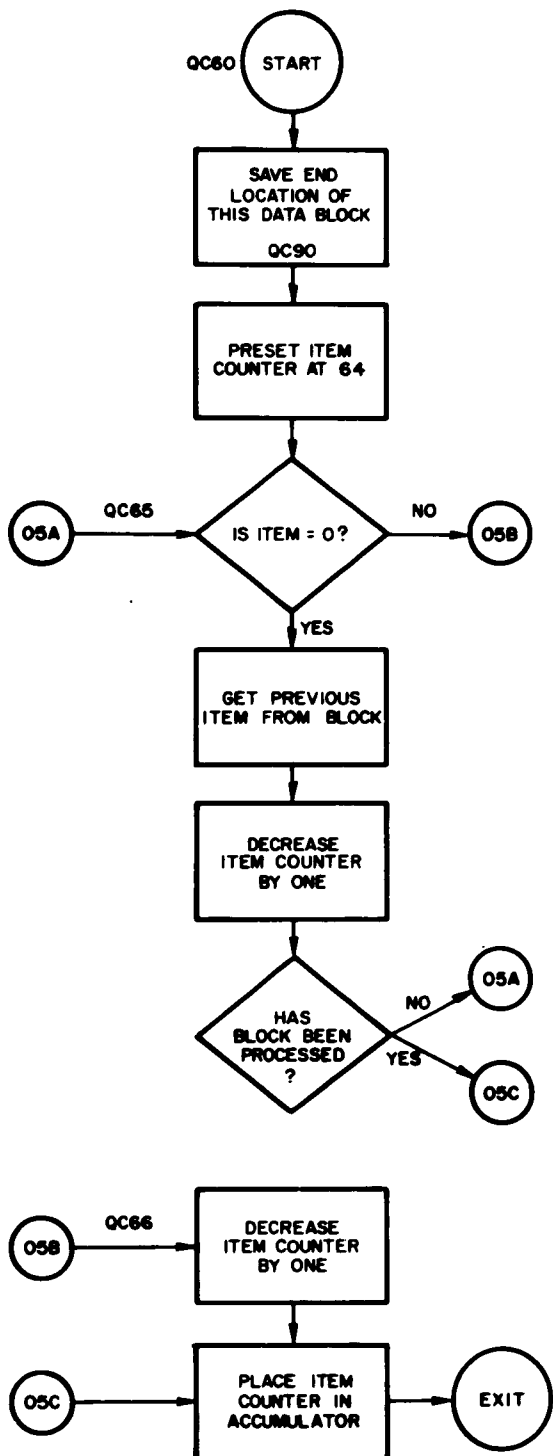






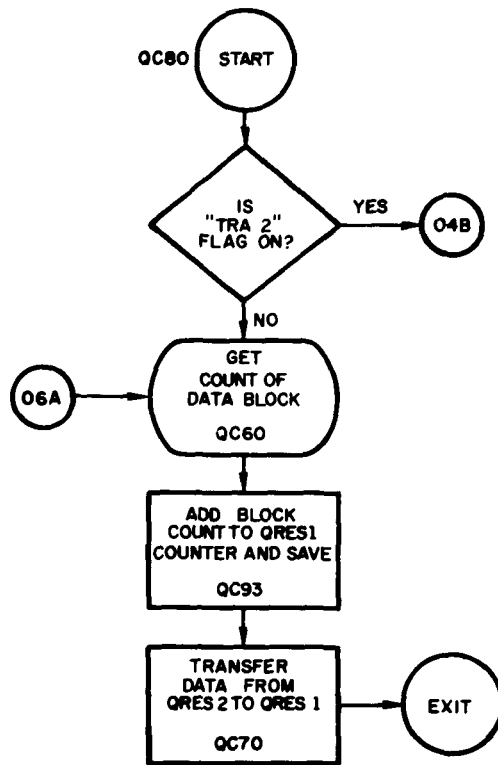
REGION QCLN  
SUBREGION QCLN2



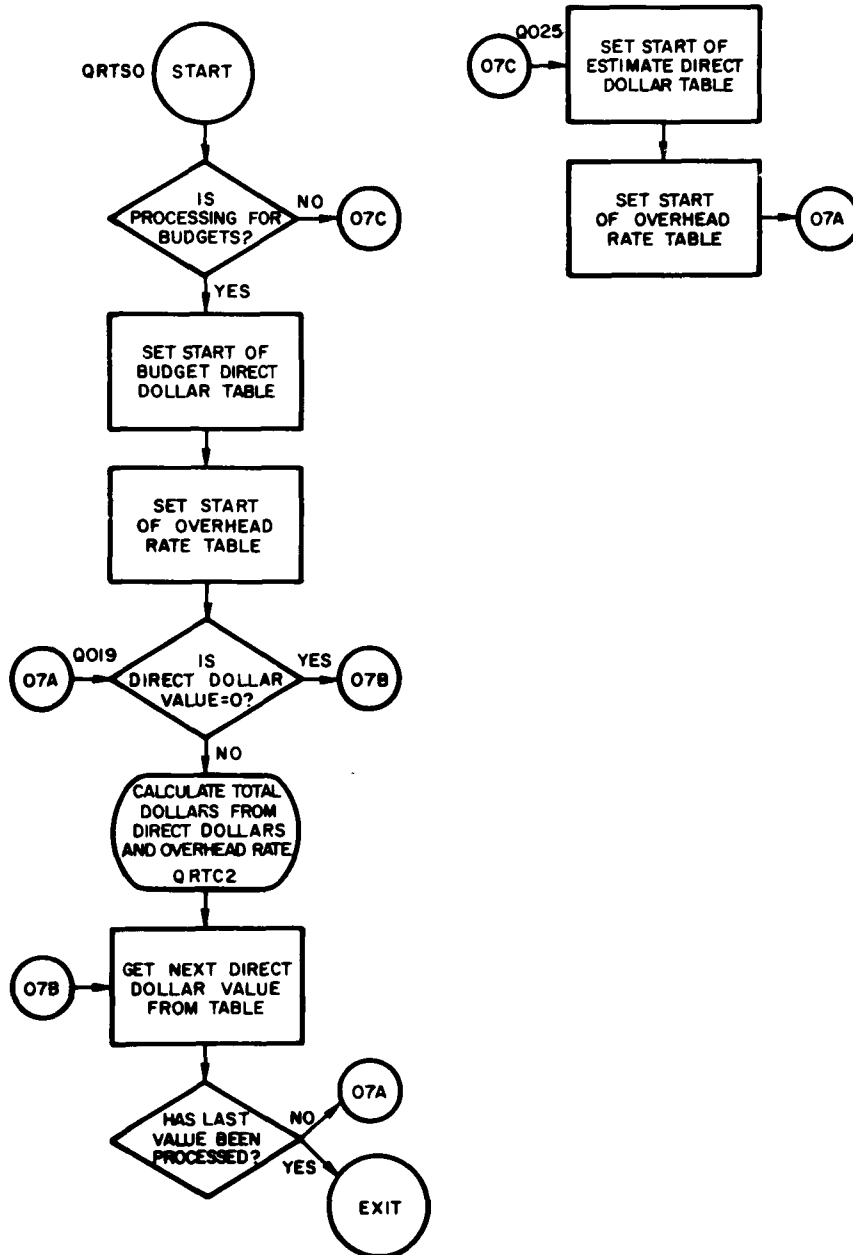


REGION QCLN  
SUBREGION QC80

---

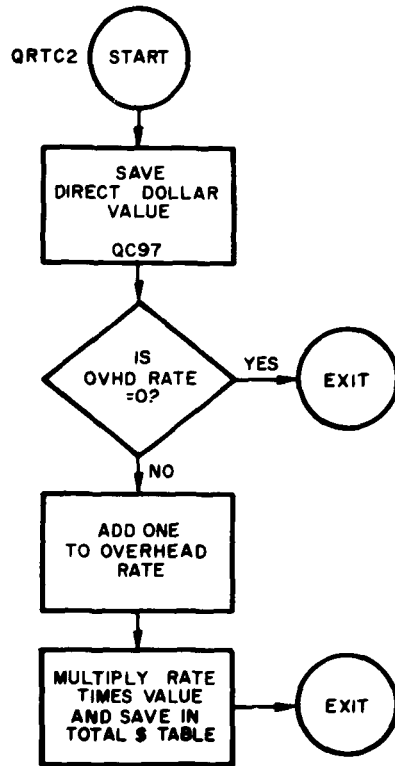


REGION QCLN  
SUBREGION QRTS0

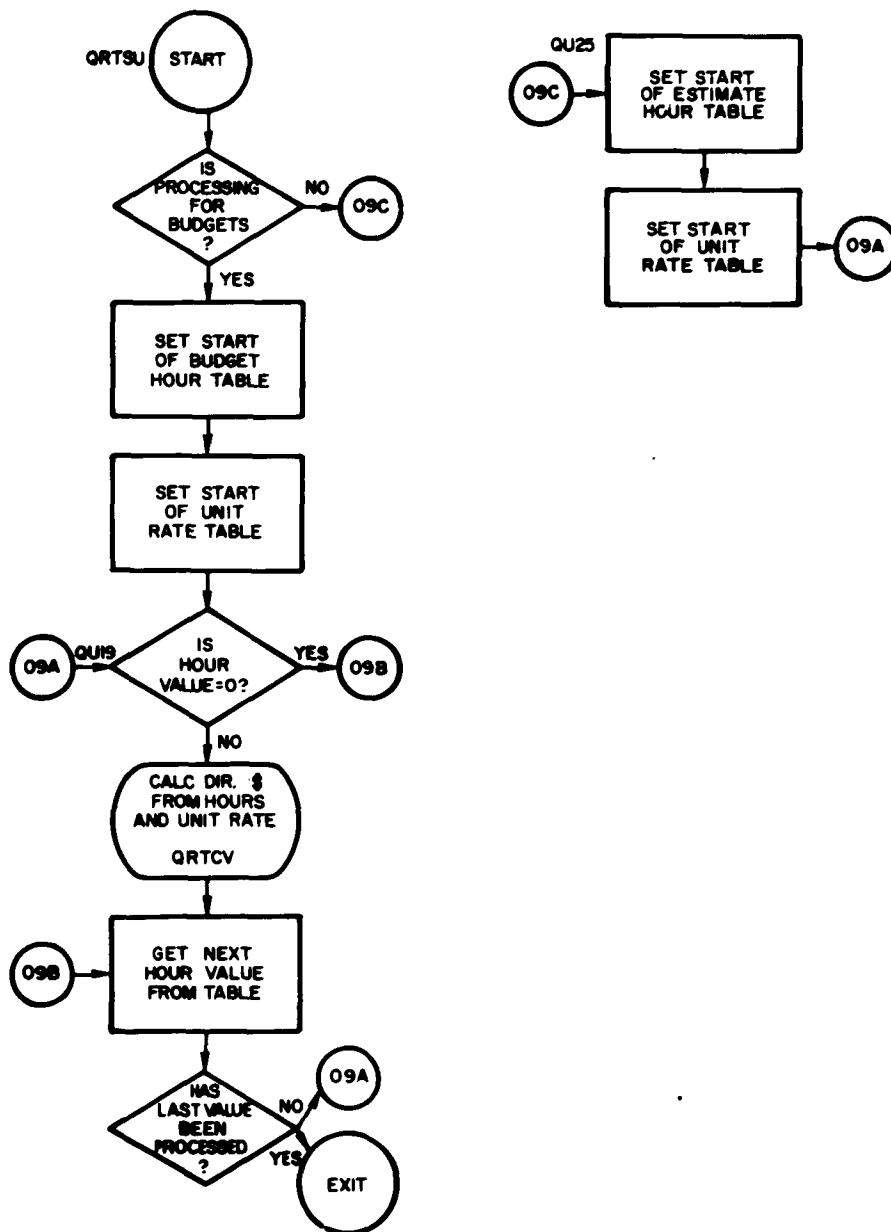


REGION QCLN  
SUBREGION QRTC2

---



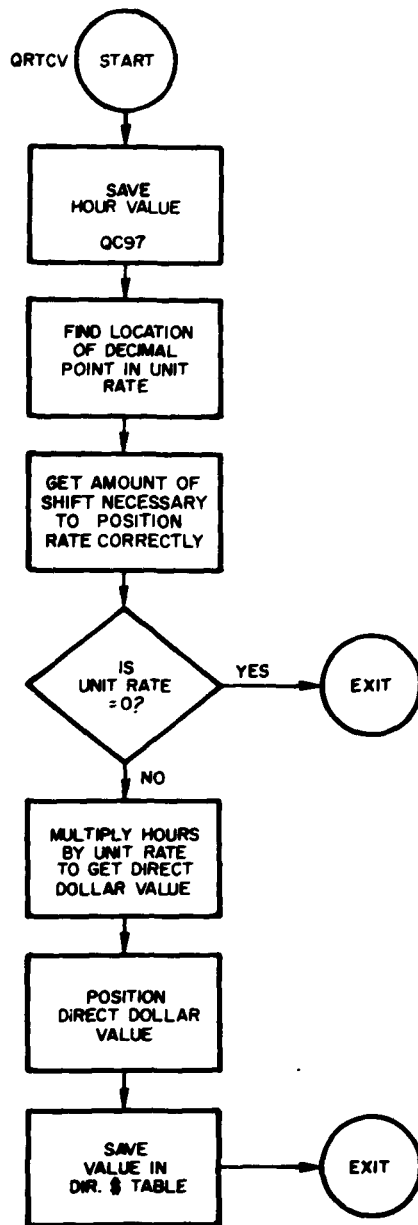
REGION QCLN  
SUBREGION QRTSU





REGION QCLN  
SUBREGION QRTCV

---



Region QSVN0

**EXPLANATION OF REGION:**

This region will operate on all the 7-0 cards that are to be processed by the system.

**CALLING SEQUENCE:**

L      TSX   QSVN0, 4  
L+1    Normal return

**INPUT:**

A 7-0 type input card from SORTED DATA TAPE.

**OUTPUT:**

The 7-0 information set into the UCHG record.

**STORAGE USED:**

Not applicable.

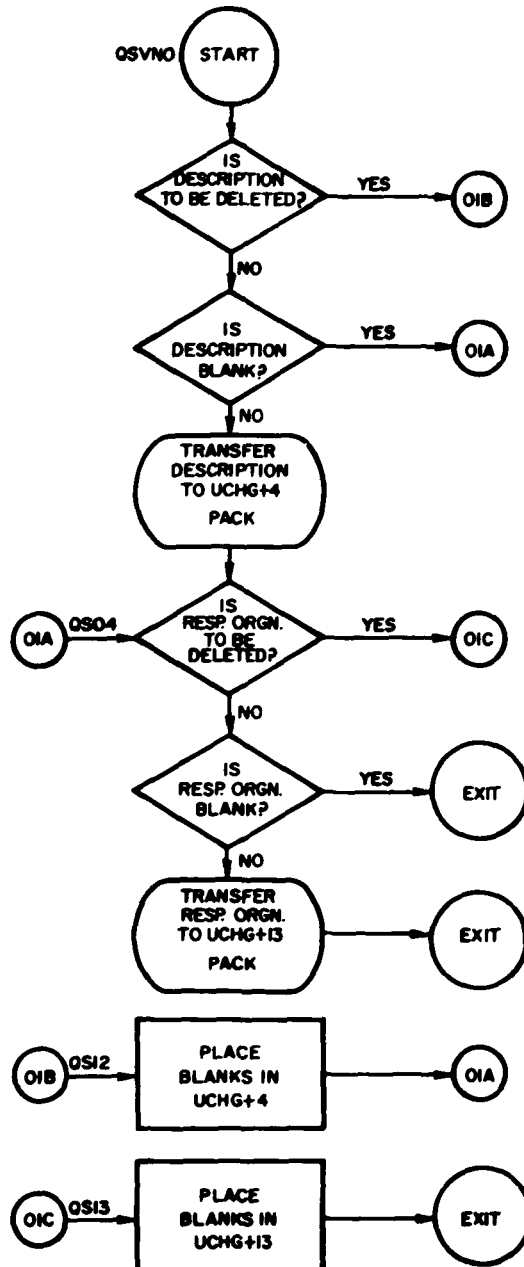
**SUBREGIONS AND SUBROUTINES USED:**

Not applicable.

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.

# REGION QSVNO



Region QSVN1

**EXPLANATION OF REGION:**

This region will operate on all the 7-1 cards that are to be processed by the system.

**CALLING SEQUENCE:**

L      TSX   QSVN1, 4

L+1    Normal return

**INPUT:**

A 7-1 type input card from SORTED DATA TAPE.

**OUTPUT:**

The 7-1 information set into the UCHG record.

**STORAGE USED:**

Not applicable.

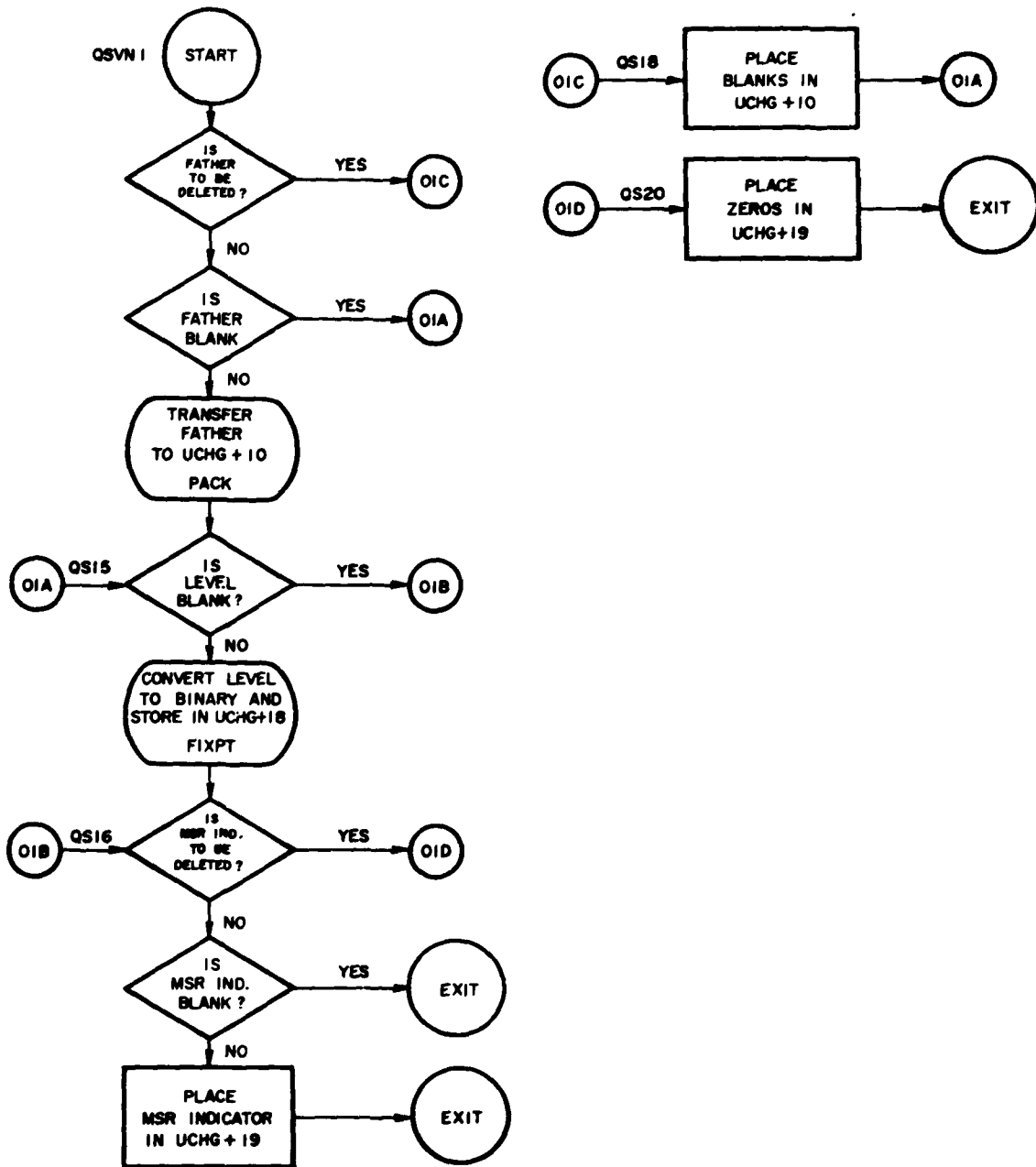
**SUBREGIONS AND SUBROUTINES USED:**

Not applicable.

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.

REGION QSVN1



Region QSVN2

**EXPLANATION OF REGION:**

This region will operate on all the 7-2 cards that are to be processed by the system.

**CALLING SEQUENCE:**

L      TSX    QSVN2, 4

L+1    Normal return

**INPUT:**

A 7-2 type input card from the SORTED DATA TAPE.

**OUTPUT:**

The 7-2 information set into the UCHG record.

**STORAGE USED:**

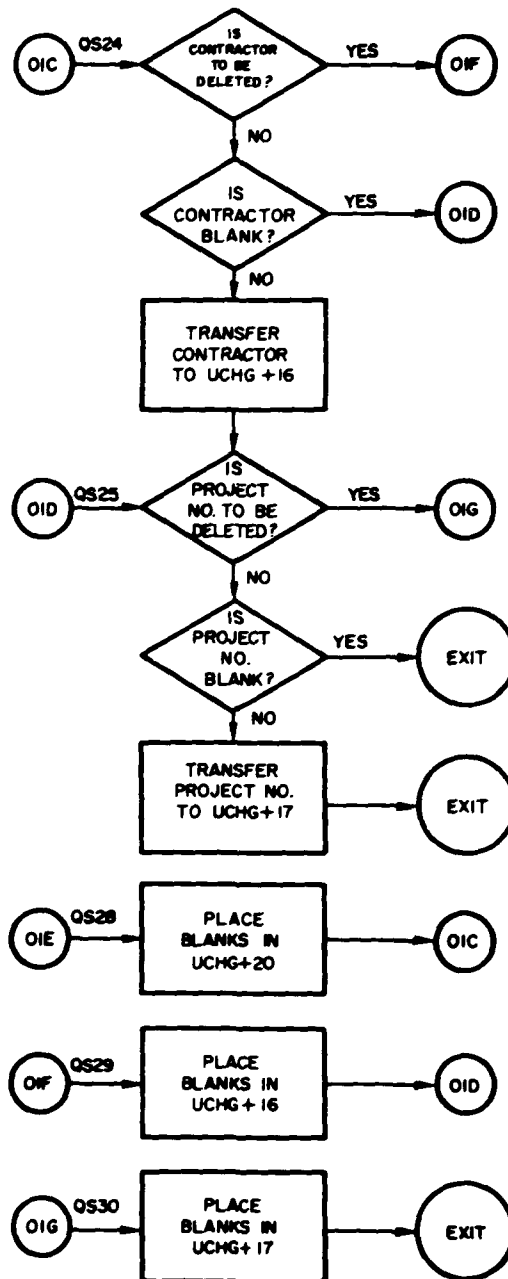
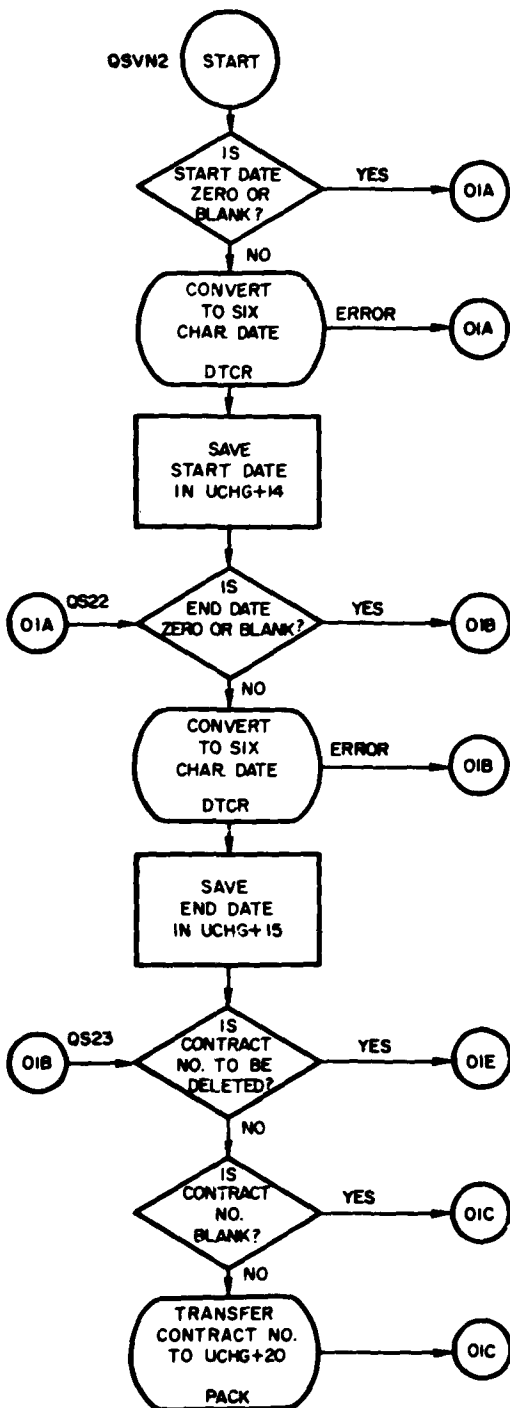
Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

Not applicable.

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.



Region QSVN3

**EXPLANATION OF REGION:**

This region will operate on all 7-3 cards that are to be processed by the system.

**CALLING SEQUENCE:**

L       TSX   QSVN3, 4  
L+1     Normal return

**INPUT:**

A 7-3 type input card from the SORTED DATA TAPE.

**OUTPUT:**

The 7-3 information set into UPUN or QRES2 records in core.

**STORAGE USED:**

Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

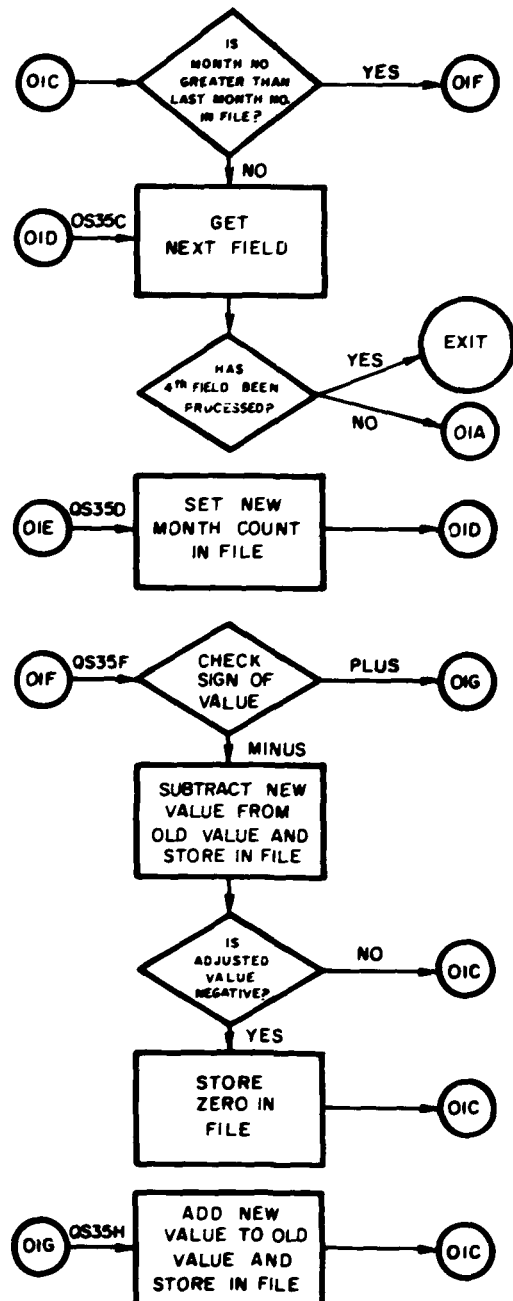
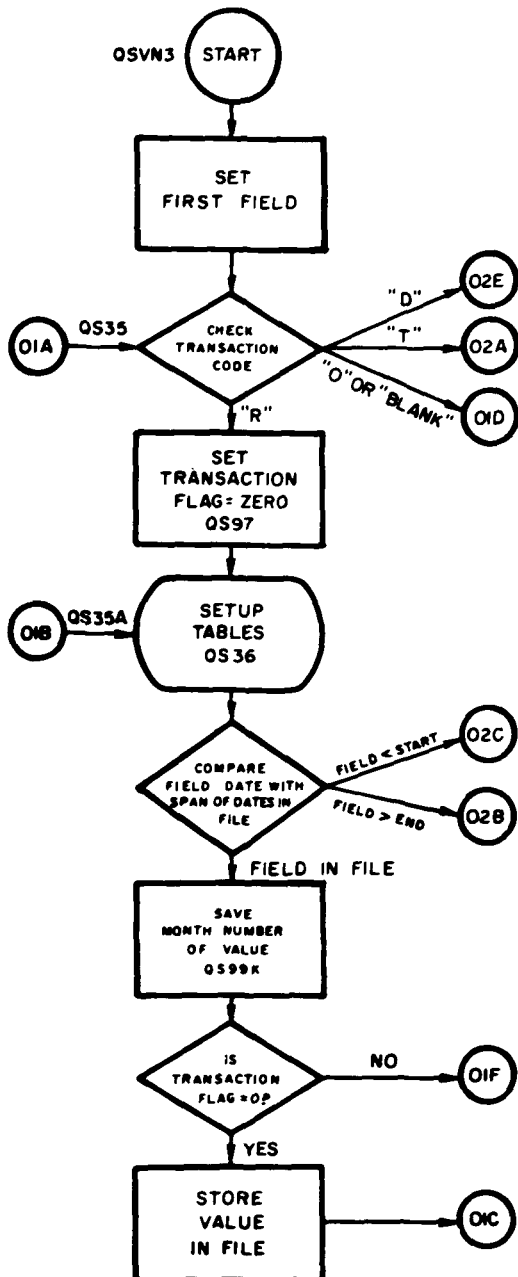
Not applicable.

**EXPLANATION OF CALLING SEQUENCE:**

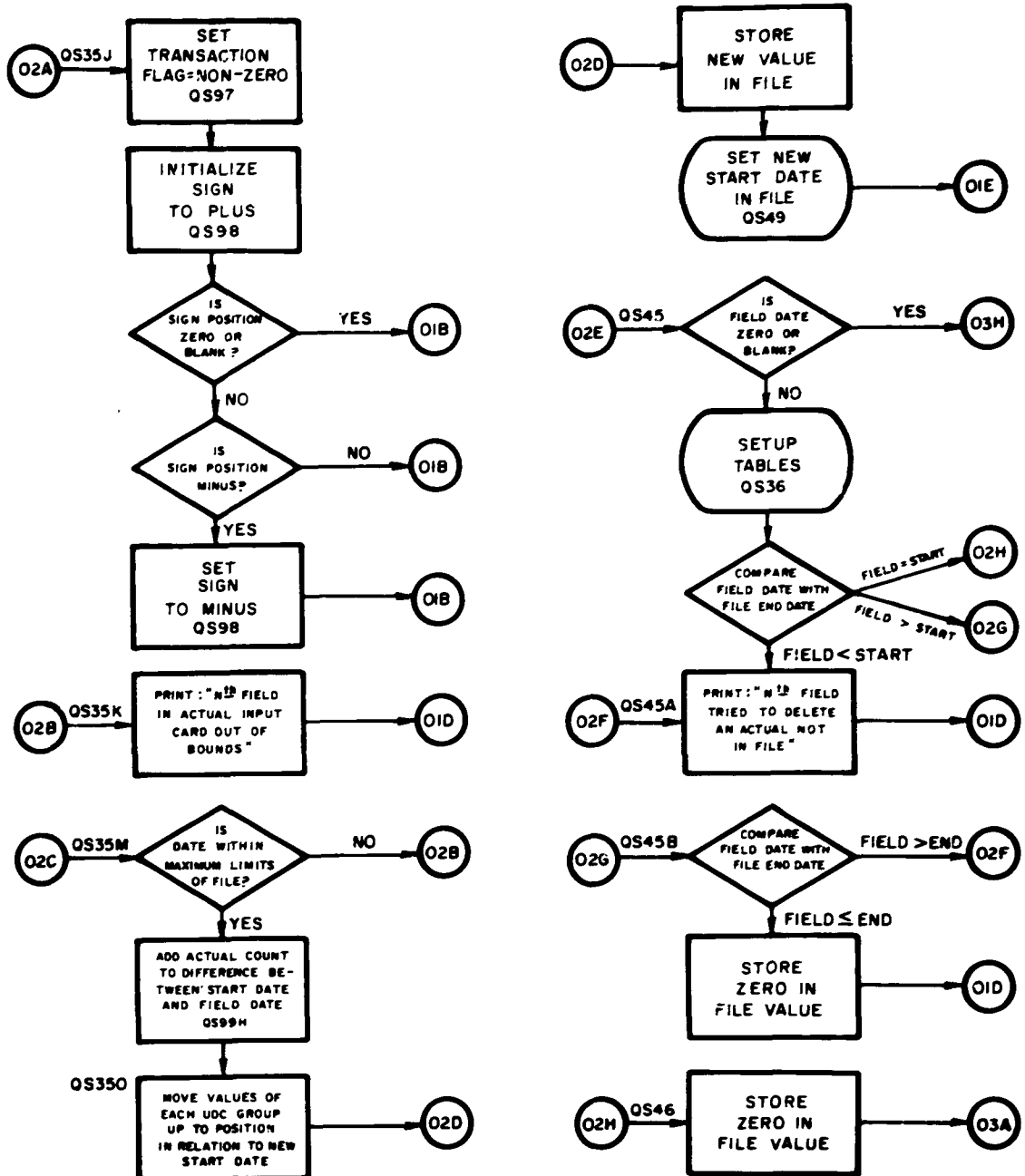
Not applicable.

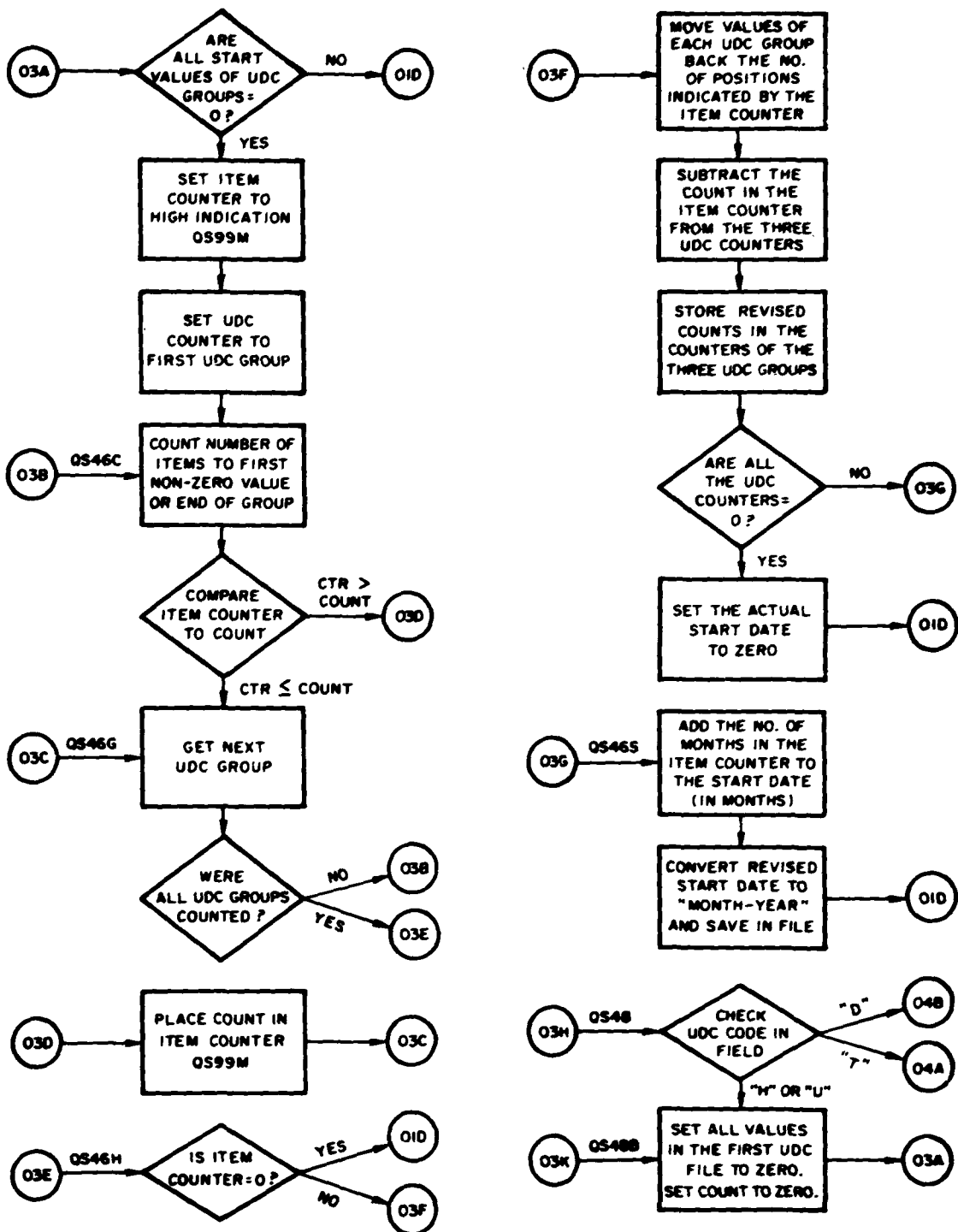


# REGION QSVN3



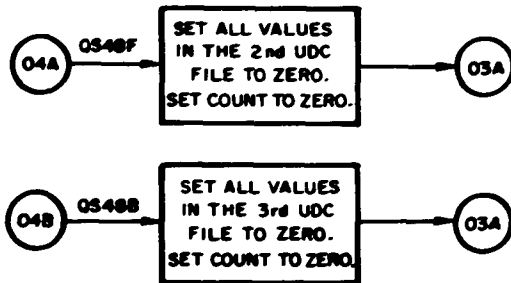
REGION QSVN3



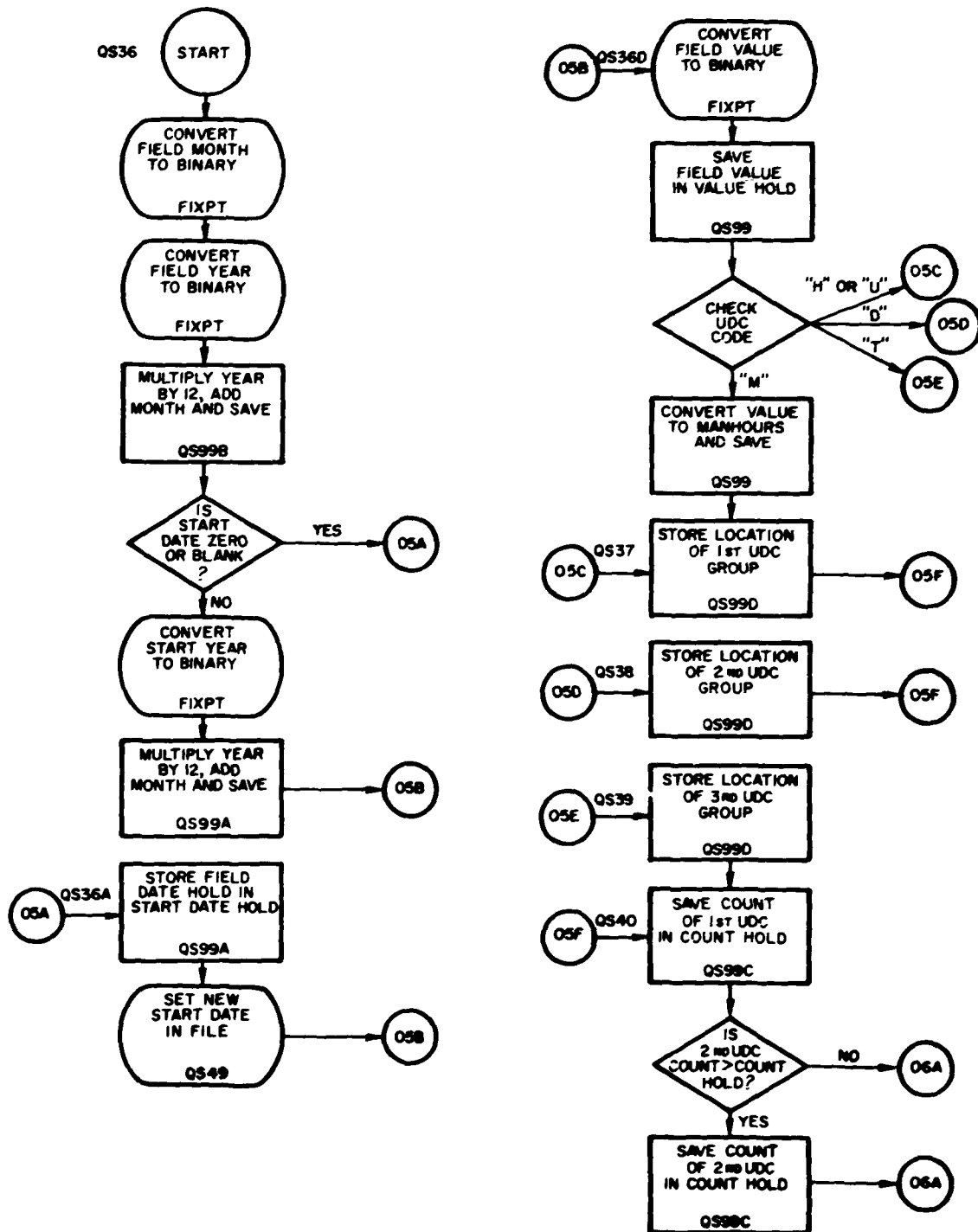


REGION Q8VNS

---

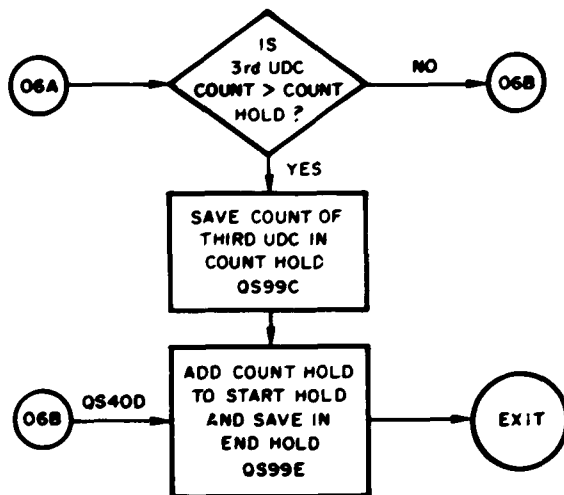


REGION QSVN3  
SUBREGION QS36



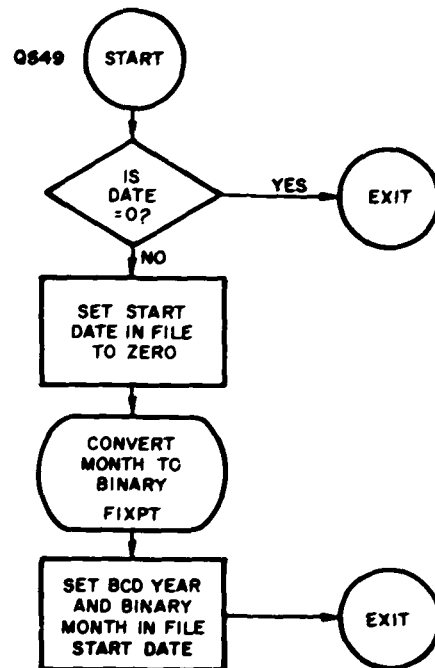
REGION QSVN3  
SUBREGION Q536

---



REGION QGVNS  
SUBREGION Q549

---



Region QSVN4

**EXPLANATION OF REGION:**

This region will operate on all the 7-4 cards that are to be processed by the system.

**CALLING SEQUENCE:**

L      TSX    QSVN4, 4

L+1    Normal return

**INPUT:**

A 7-4 type input card from the SORTED DATA TAPE.

**OUTPUT:**

The 7-4 information set into the UPUN or QRES2 records in core.

**STORAGE USED:**

Not applicable.

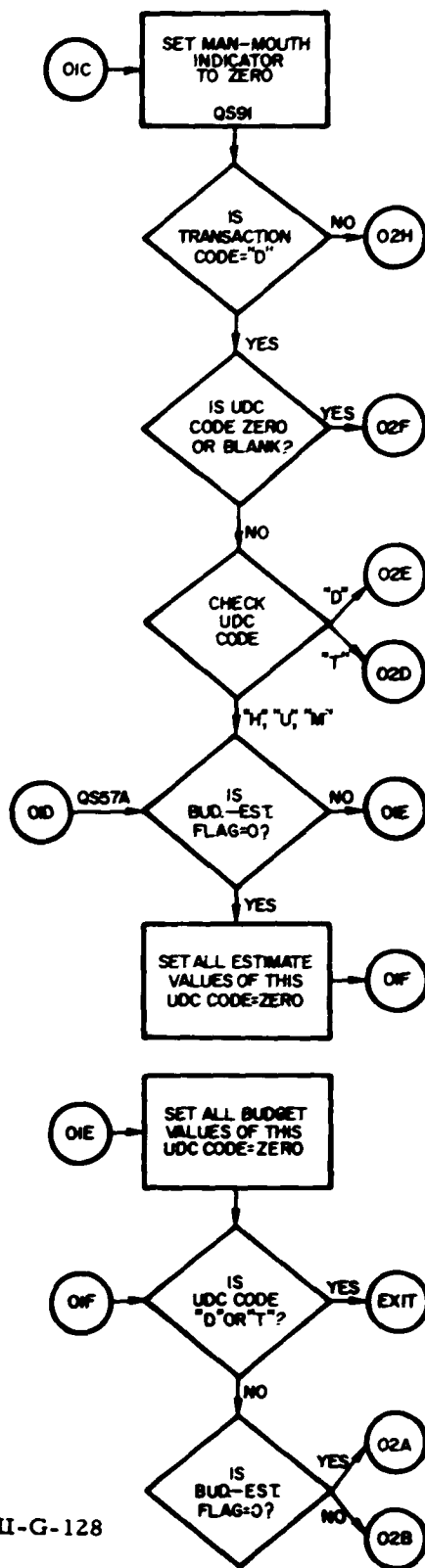
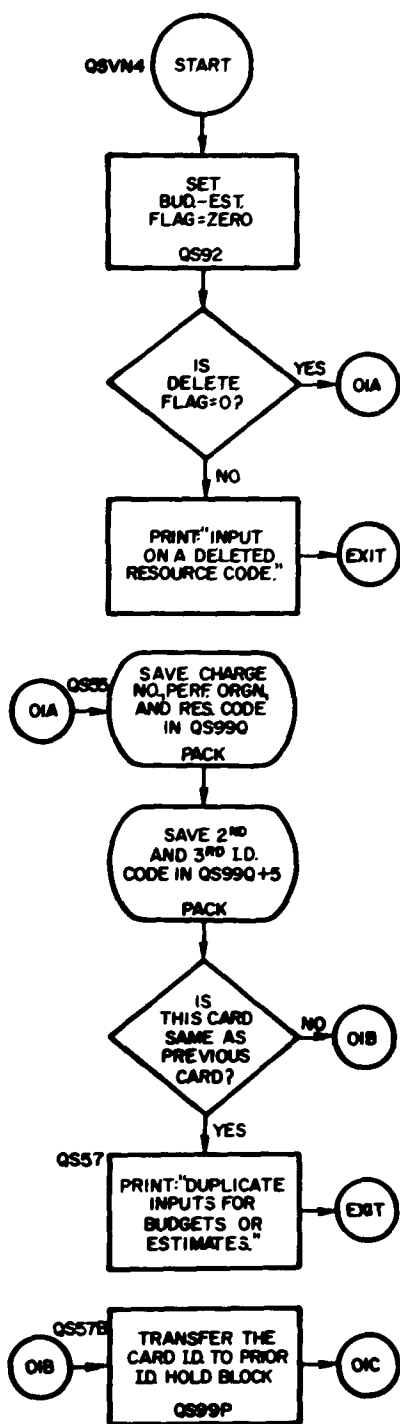
**SUBREGIONS AND SUBROUTINES USED:**

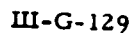
Not applicable.

**EXPLANATION OF CALLING SEQUENCE:**

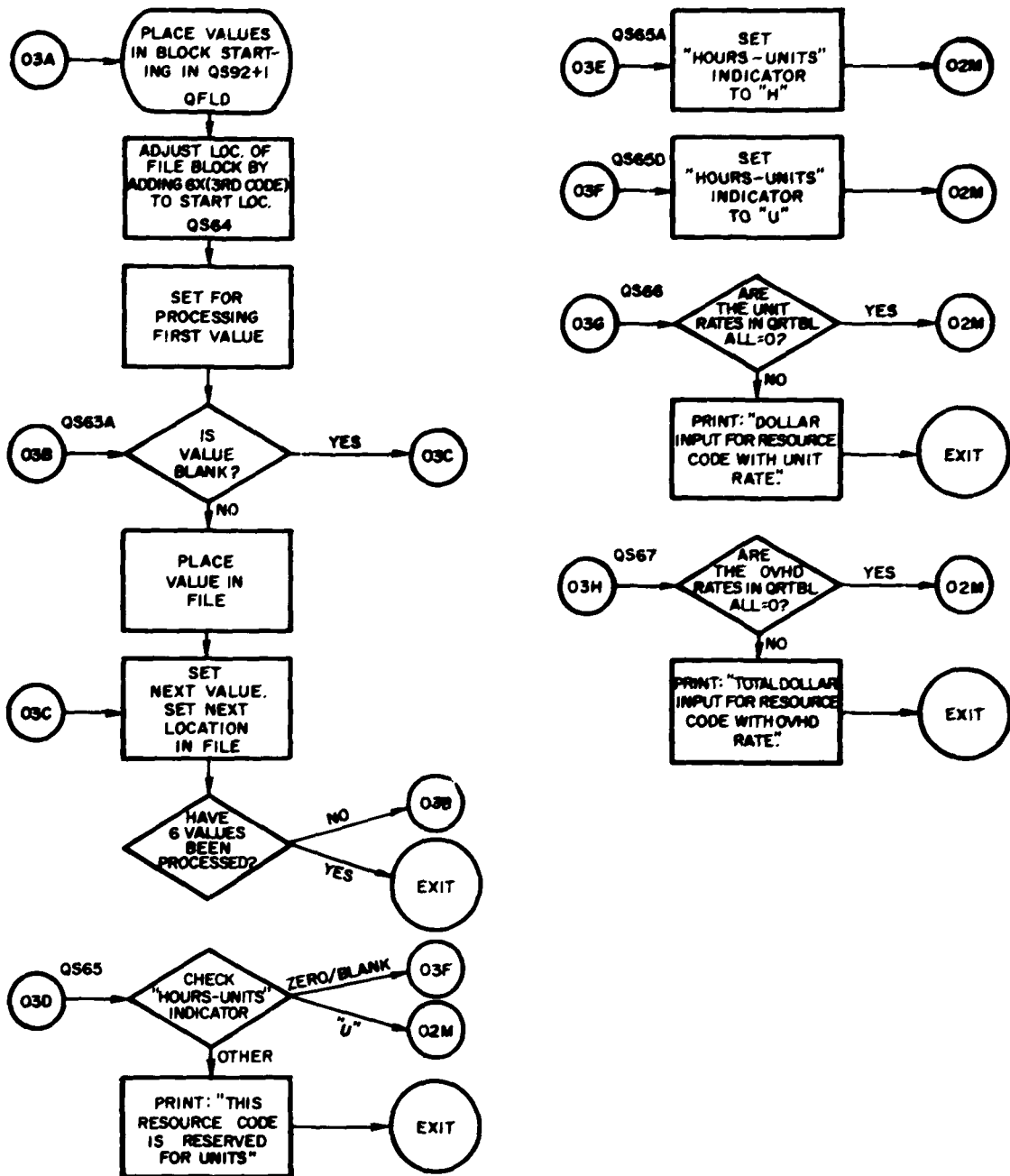
Not applicable.



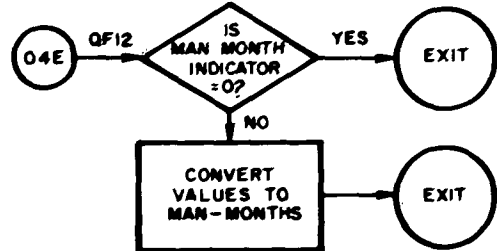
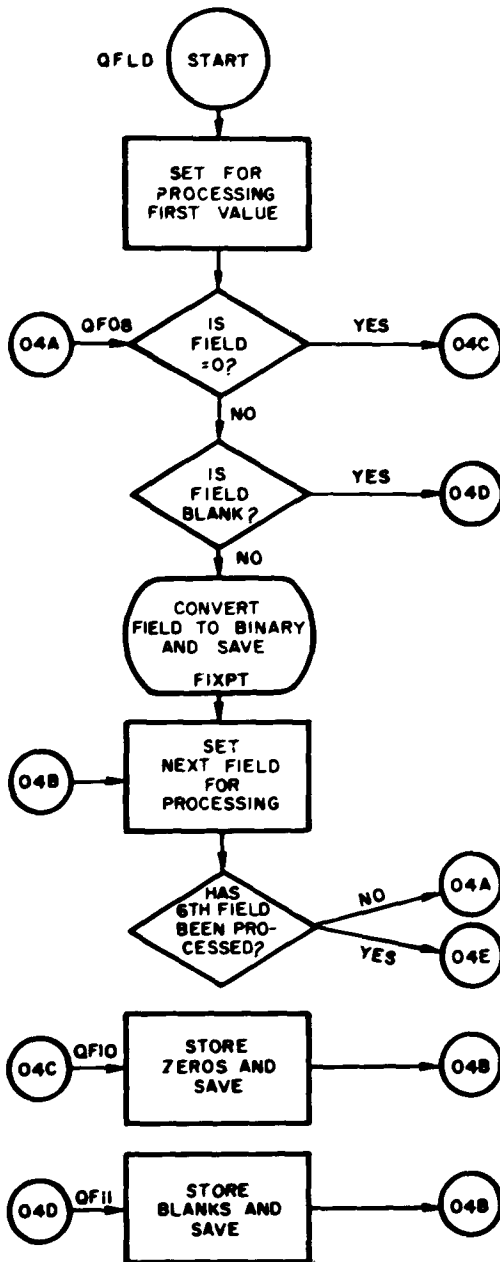




REGION Q8VN4



REGION Q8VNA  
SUBREGION QFLD



Region QSVN5

**EXPLANATION OF REGION:**

This region will operate on all the 7-5 cards that are to be processed by the system.

**CALLING SEQUENCE:**

L      TSX    QSVN5, 4

L+1    Normal return

**INPUT:**

A 7-5 type input card from the SORTED DATA TAPE.

**OUTPUT:**

The 7-5 information set into the UPUN or QRES2 records in core.

**STORAGE USED:**

Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

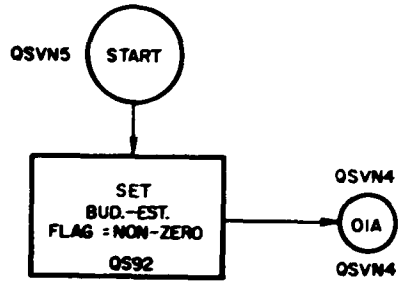
Not applicable.

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.

REGION QSVN5

---



Region SETUP

**EXPLANATION OF REGION:**

This region will set up the proper channels on the sort tapes for the output pre processing using the 4-tape sort.

**CALLING SEQUENCE:**

L      TSX    SETUP, 4

L+1    Normal return

**INPUT:**

Not applicable.

**OUTPUT:**

Proper setup of sort tapes.

**STORAGE USED:**

Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

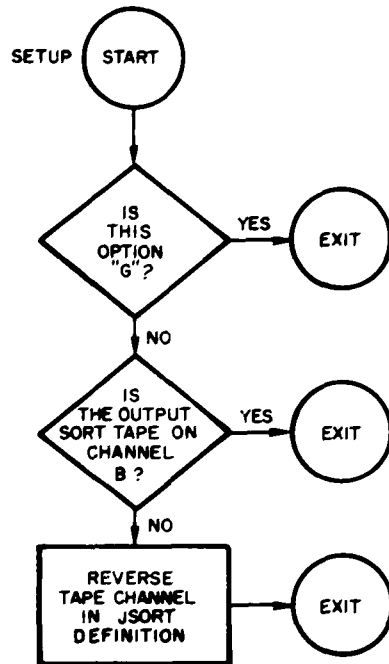
Not applicable.

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.

# REGION SETUP

---





### Region QSRTB

#### EXPLANATION OF REGION:

This routine will set up the working rate table to be used in extending rates into QRES2. This table will be set up at core location QRTBL and QRTB2.

#### CALLING SEQUENCE:

L      TSX   QSRTB, 4  
L+1    Normal return

#### INPUT:

The rate table at RTBAR.

#### OUTPUT:

A working rate table for a particular Performing Unit/Resource Code combination at QRTBL and QRTB2.

#### STORAGE USED:

QRTBL - 64 words - the unit and overhead rates for a particular month tied to charge number start date.

QRTB2 - 64 words - the scaling indicator for the unit rate.

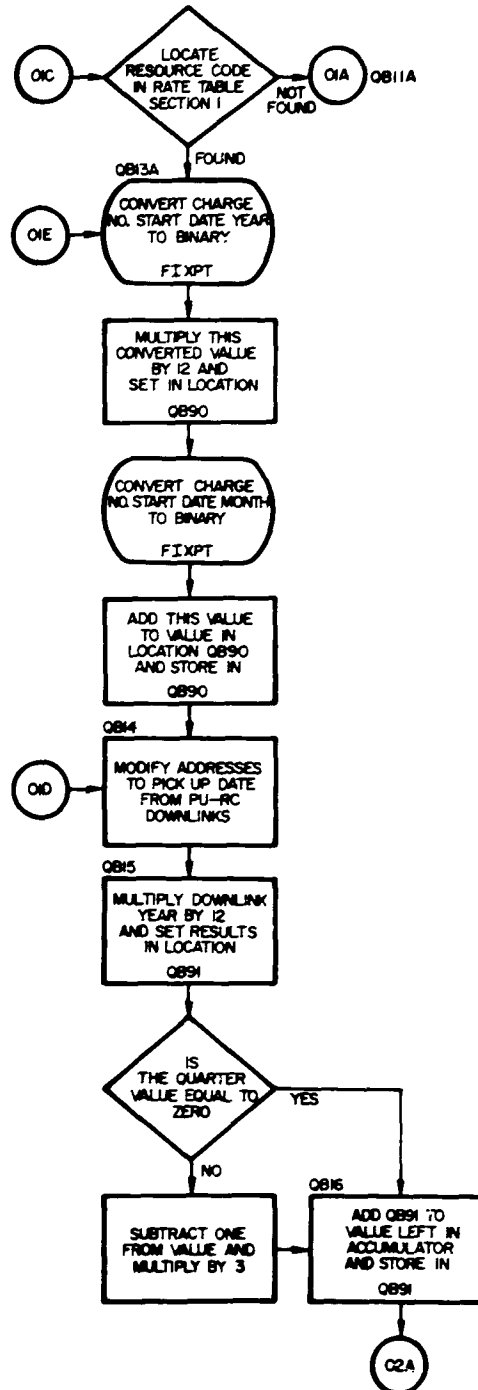
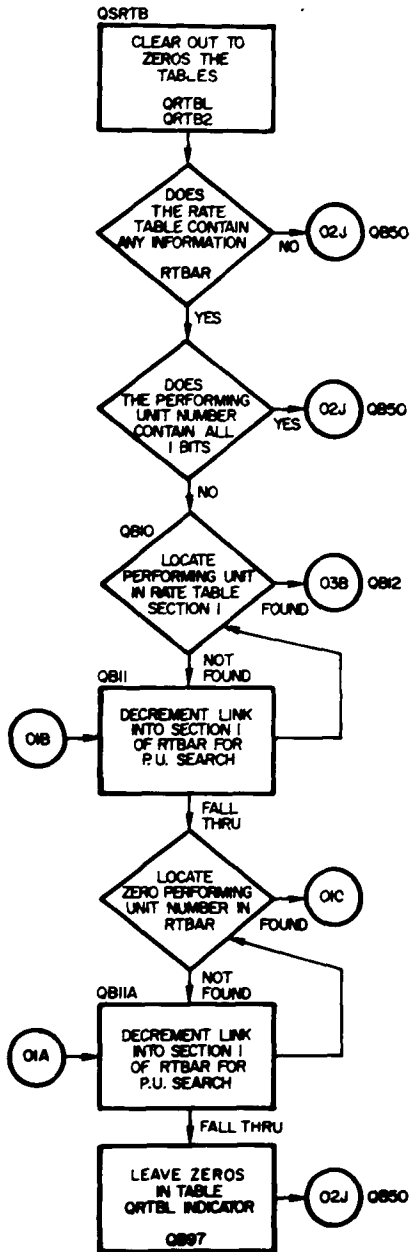
#### SUBREGIONS AND SUBROUTINES USED:

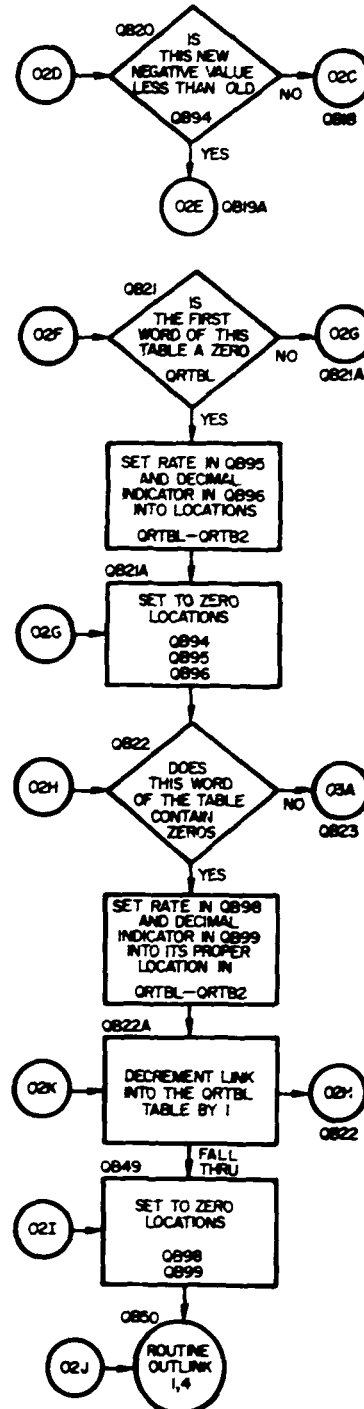
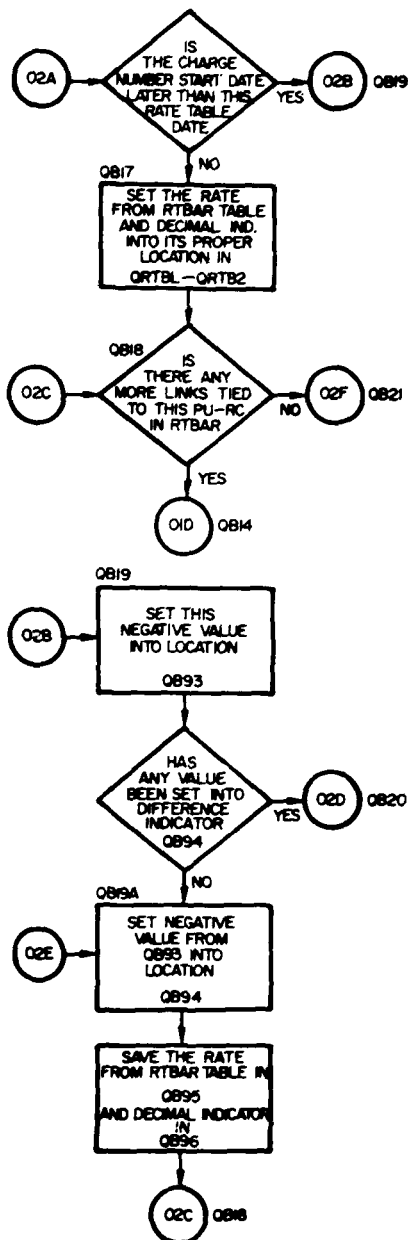
FIXPT

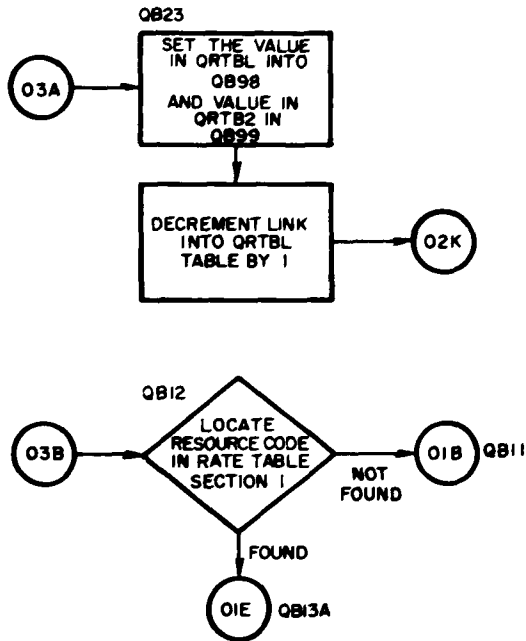
#### EXPLANATION OF CALLING SEQUENCE:

Not applicable.

SET UP RATE TABLE  
FOR A PU-RC USAGE







### Cost Update Tape and Table Layouts

The following tape and table layouts will illustrate the manner in which the cost update phase will operate.

#### PERT COST MASTER FILE Tape Layout

The PERT Cost data is actually the second file on this physical tape, the first being the SECONDARY MASTER TAPE. The data carried on this second file consists of a rate table and a skill table, both preceded by a label, and a data file, also preceded by a label (see Fig. III-G-9). This file is written in a binary mode.

The rate table label is one record of 6 words, which is followed by the rate table record of 4003 words. This table is the first item on the PERT COST MASTER TAPE and will contain no checksum, since it is a fixed-length write. The date in the label refers to the last update cycle date for cost data processing.

The skill table label is one record of 6 words, which is followed by the skill table record of 1080 words. This table is the second item on the PERT COST MASTER TAPE and will contain no checksum, since it is a fixed-length write. The date in the label refers to the last update cycle date for cost data processing.

The charge or summary number data file label is made up of two records. One is the label name, date, and tape number; the other is the program name. These labels will contain no checksum, since they are a fixed-length write. Following the labels will be the data records in blocks up to 600 words. These records, since they are variable and written by the Writer routine (Page IV-G-1), will contain a count record and a checksum.

Each charge or summary number record will begin with a type 1 record in bits 5 through 2. This is the fixed-portion data of this number and will relate to all of the following Performing Unit Resource Code combinations, if any. This fixed portion record will always contain a word count, preceding

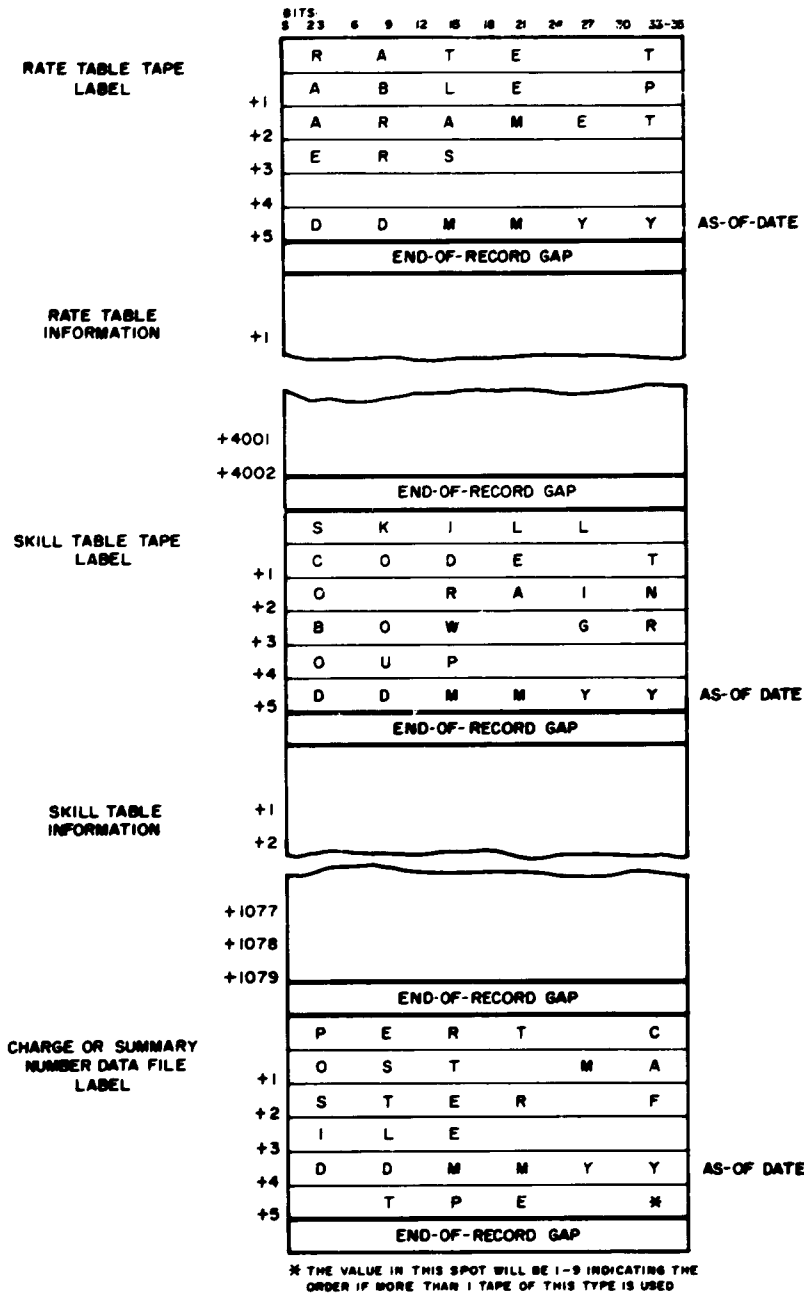


Fig. III-G-9. Physical Layout of PERT COST MASTER

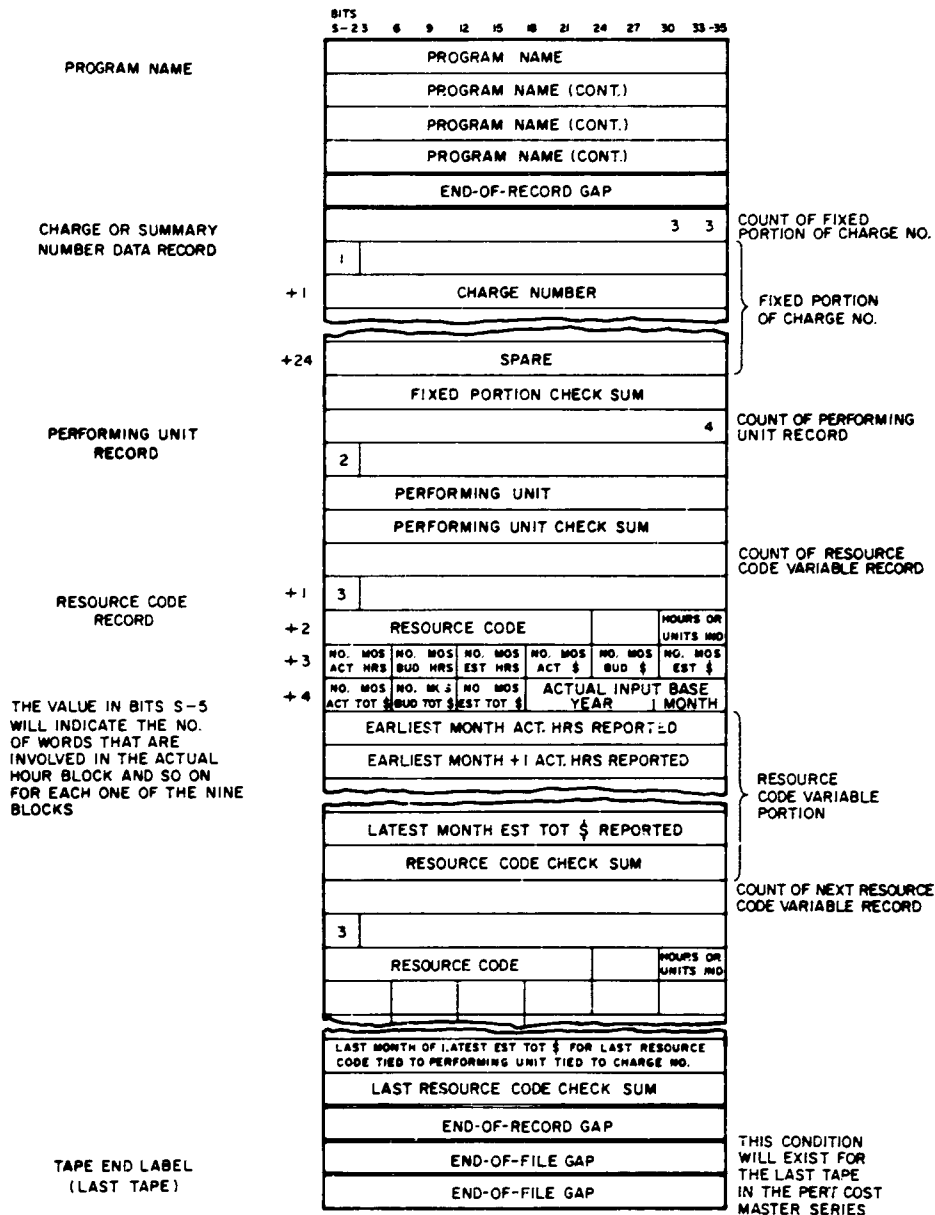


Fig. III-G-9. Physical Layout of PERT COST MASTER (Continued)

the code 1 word, of an octal 33, indicating there are 27 decimal words in this logical record including the count and checksum.

If the charge or summary number contains a Performing Unit/Resource Code combination, the record following the fixed portion changes is a performing unit record. This record may have one or many resource codes tied to it, but in either case it will appear only once in front of all of its tied resource codes. This performing unit record will always contain a word count of 4 in bits 5 through 2 preceding the code 2, indicating there are 4 words in this logical record including the count and checksum.

The resource code record is the lowest level of record on the PERT COST MASTER TAPE and varies in size according to the number of months that carry costs. This records count will vary from a minimum of 6 to a maximum of 573 and in the word following the count will be a 3 code in bits 5 through 2 to signify a resource code record. An indicator is carried in the word following the 3 code, in the sixth character, to signify whether hours or units are carried by this resource code. An "H" will signify hours and a "U" will mean units. The information following this code in the +3 and +4 words will indicate the number of words that are involved with each one of the nine blocks that is associated with this data. Each of the nine blocks will contain a number from 0 to octal 77, indicating the number of months that carry costs for that particular field. The variable portion of the resource code will be made up by packing the number of words carried in each one of the blocks, starting with actual hours and ending with estimated total dollars. The actual input base date in the +4 word will contain the BCD year in characters 4 and 5 and the month in octal in character 6. Following each resource code logical record will be a checksum.

#### PERT Cost Charge Number, Performing Unit, and Resource Code Table Layouts

These record layouts will show the 3 types of records making up the PERT Cost data file. They will show in detail the information carried as well as



|                    |                                                   |                          |                          |                        |                           |              |
|--------------------|---------------------------------------------------|--------------------------|--------------------------|------------------------|---------------------------|--------------|
| DESCRIPTION        | WORD 0                                            | 1                        | 2                        | 3                      | 4                         | 5            |
|                    | CHARGE NUMBER INDICATOR                           | CHARGE OR SUMMARY NUMBER |                          |                        | CHARGE NUMBER DESCRIPTION |              |
| CHARACTER LOCATION | 1st 3 BITS                                        | (18H)                    |                          |                        | (36H)                     |              |
|                    | WORD 6                                            | 7                        | 8                        | 9                      | 10                        | 11           |
| DESCRIPTION        | CHARGE NUMBER DESCRIPTION (CONT)                  |                          |                          |                        |                           |              |
| CHARACTER LOCATION | CHARGE NUMBER (FATHER) NEXT HIGHER RELATION (18H) |                          |                          |                        |                           |              |
|                    | WORD 12                                           | 13                       | 14                       | 15                     | 16                        | 17           |
| DESCRIPTION        | CHARGE NUMBER (FATHER) (CONT)                     | RESPONSIBLE ORGN NUMBER  | CHARGE NUMBER START DATE | CHARGE NUMBER END DATE | CONTRACTOR CODE           | NETWORK CODE |
| CHARACTER LOCATION | (6H)                                              | D D M M Y Y              | D D M M Y Y              | D D M M Y Y            | (4H)                      | (6H)         |
|                    | WORD 18                                           | 19                       | 20                       | 21                     | 22                        | 23           |
| DESCRIPTION        | LEVEL CODE                                        | CONTRACT NUMBER          |                          |                        | SPARE                     |              |
| CHARACTER LOCATION | BIN @ B35                                         | (18H)                    |                          |                        |                           |              |
|                    | WORD 24                                           |                          |                          |                        |                           |              |
| DESCRIPTION        | SPARE                                             |                          |                          |                        |                           |              |
| CHARACTER LOCATION |                                                   |                          |                          |                        |                           |              |

Fig. III-G-10. Tape Format of Charge or Summary Number Fixed-Portion Record (UCHG)

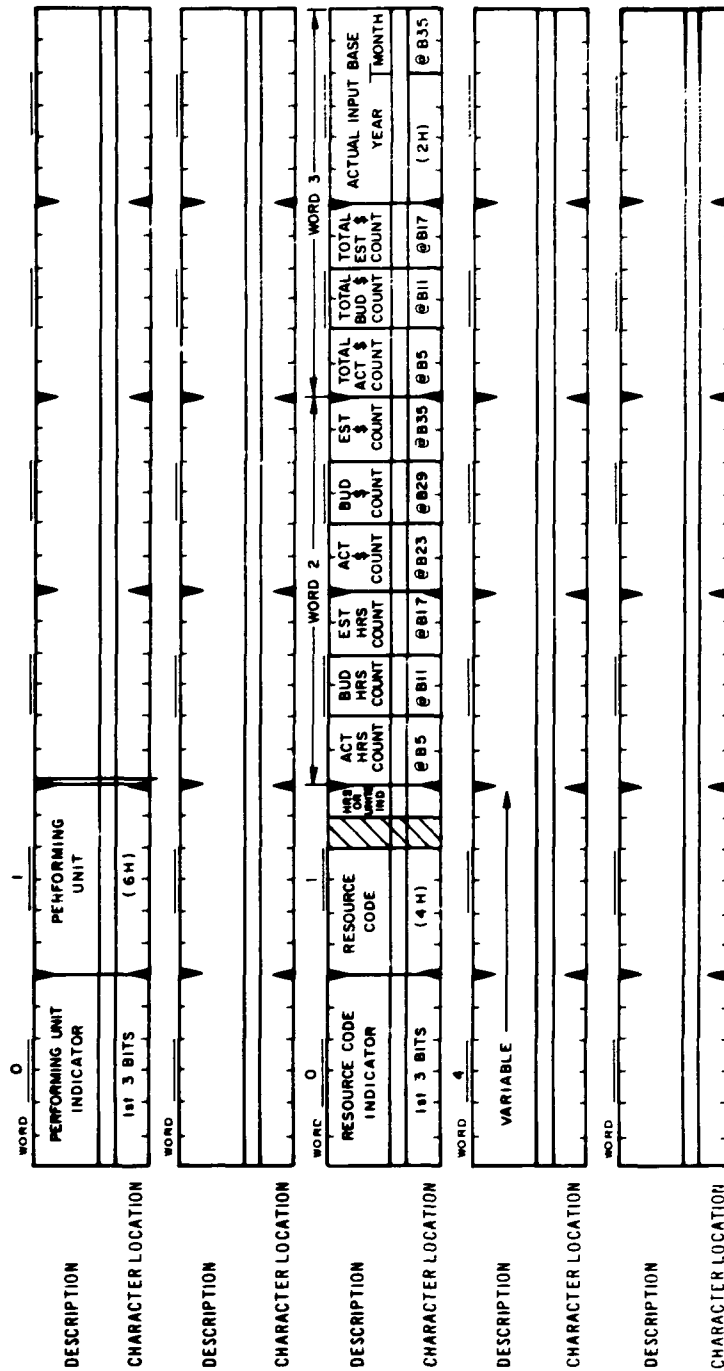


Fig. III-G-11. Tape Format of QRES2 and QRES1 Logical Records on PERT COST MASTER

the position in the record of this data. Figure III-G-10 is the record format for the charge number fixed-portion data, and is carried in core at location UCHG. Figure III-G-11 shows the detail record layouts for both the performing unit and resource code indicators which would be carried in core at UPUN and QRES2, respectively.

#### Resource Code Tables in Core

The record area in the QRES2 Table (Fig. III-G-12) is the working area for the resource code. Each of the nine fields is set up to its maximum and the packed data from the OLD PERT COST MASTER is unpacked into its respective field. The actual data is shifted in this record relative to a change in the actual base date, and the rate extensions are made in this table, where applicable, for the budgets and estimates. When 7-3, 7-4, or 7-5 input for this resource code is processed from the SORTED DATA TAPE, the changes will be made in the QRES2 Table. At the completion of all inputs for this table the data is packed again and set out onto QRES 1 (Figure III-G-13) to be written on the NEW PERT COST MASTER TAPE.

#### Rainbow Category and Cost Category Record

This record will contain the rainbow category and cost category related to a particular resource code. It will be set up in core location RCMC in the following format.

| WORD | 1                | 2 | 3 | 4 | 5             | 6 | 7 |
|------|------------------|---|---|---|---------------|---|---|
|      | RAINBOW CATEGORY |   |   |   | COST CATEGORY |   |   |

RECORD RCMC

#### Working Rate Table

The working rate table is created for a particular Performing Unit/Resource Code or resource code combination related to the charge number start date. This table will set up the rates carried in the rate table at

QRES2

|                                      |                                                                                        |  |                    |  |                    |  |                   |  |                |  |                |  |                   |  |  |  |  |  |  |  |  |  |  |
|--------------------------------------|----------------------------------------------------------------------------------------|--|--------------------|--|--------------------|--|-------------------|--|----------------|--|----------------|--|-------------------|--|--|--|--|--|--|--|--|--|--|
| BITS                                 |                                                                                        |  |                    |  |                    |  |                   |  |                |  |                |  |                   |  |  |  |  |  |  |  |  |  |  |
| 3 2 3 6 9 12 15 18 21 24 27 30 33-36 |                                                                                        |  |                    |  |                    |  |                   |  |                |  |                |  |                   |  |  |  |  |  |  |  |  |  |  |
| 3                                    |                                                                                        |  |                    |  |                    |  |                   |  |                |  |                |  |                   |  |  |  |  |  |  |  |  |  |  |
| +1                                   | RESOURCE CODE                                                                          |  |                    |  |                    |  |                   |  |                |  |                |  | HOURS OR UNIT IND |  |  |  |  |  |  |  |  |  |  |
| +2                                   | NO. MOS ACT HRS                                                                        |  | NO. MOS BUD HRS    |  | NO. MOS EST HRS    |  | NO. MOS ACT \$    |  | NO. MOS BUD \$ |  | NO. MOS EST \$ |  |                   |  |  |  |  |  |  |  |  |  |  |
| +3                                   | NO. MOS ACT TOT \$                                                                     |  | NO. MOS BUD TOT \$ |  | NO. MOS EST TOT \$ |  | ACTUAL INPUT YEAR |  |                |  | BASE MONTH     |  |                   |  |  |  |  |  |  |  |  |  |  |
| +4                                   |                                                                                        |  |                    |  |                    |  |                   |  |                |  |                |  |                   |  |  |  |  |  |  |  |  |  |  |
|                                      | 63 MONTHS OF POSSIBLE DATA RELATING TO ACTUAL INPUT BASE FOR ACTUAL HOURS              |  |                    |  |                    |  |                   |  |                |  |                |  |                   |  |  |  |  |  |  |  |  |  |  |
| +66                                  |                                                                                        |  |                    |  |                    |  |                   |  |                |  |                |  |                   |  |  |  |  |  |  |  |  |  |  |
| +67                                  |                                                                                        |  |                    |  |                    |  |                   |  |                |  |                |  |                   |  |  |  |  |  |  |  |  |  |  |
|                                      | 63 MONTHS OF POSSIBLE DATA RELATING TO THE CHARGE NUMBER START DATE FOR BUDGET HOURS   |  |                    |  |                    |  |                   |  |                |  |                |  |                   |  |  |  |  |  |  |  |  |  |  |
| +130                                 |                                                                                        |  |                    |  |                    |  |                   |  |                |  |                |  |                   |  |  |  |  |  |  |  |  |  |  |
|                                      | 63 MONTHS OF POSSIBLE DATA RELATING TO THE CHARGE NUMBER START DATE FOR ESTIMATE HOURS |  |                    |  |                    |  |                   |  |                |  |                |  |                   |  |  |  |  |  |  |  |  |  |  |
| +193                                 |                                                                                        |  |                    |  |                    |  |                   |  |                |  |                |  |                   |  |  |  |  |  |  |  |  |  |  |
| +256                                 |                                                                                        |  |                    |  |                    |  |                   |  |                |  |                |  |                   |  |  |  |  |  |  |  |  |  |  |
| +319                                 |                                                                                        |  |                    |  |                    |  |                   |  |                |  |                |  |                   |  |  |  |  |  |  |  |  |  |  |
| +382                                 |                                                                                        |  |                    |  |                    |  |                   |  |                |  |                |  |                   |  |  |  |  |  |  |  |  |  |  |
| +445                                 |                                                                                        |  |                    |  |                    |  |                   |  |                |  |                |  |                   |  |  |  |  |  |  |  |  |  |  |
| +508                                 |                                                                                        |  |                    |  |                    |  |                   |  |                |  |                |  |                   |  |  |  |  |  |  |  |  |  |  |
| +570                                 |                                                                                        |  |                    |  |                    |  |                   |  |                |  |                |  |                   |  |  |  |  |  |  |  |  |  |  |

REPEAT OF THE FIRST THREE 63 WORD FIELDS FOR DIRECT DOLLARS

REPEAT OF THE FIRST THREE 63 WORD FIELDS FOR TOTAL DOLLARS



RTBAR, if any, for 63 individual months from the charge number start date. The program will use this working rate table to make all rate extensions that are needed. This table will be located in core at QRTBL and QRTB2. If the rate information for unit and overhead rates are in the RTBAR Table, the table at QRTB2 will contain the rates in the same format as the RTBAR Table. The only difference will be that the rates in the QRTBL Table refer to a month period. If there are no rates for a particular resource code, this table will contain zeros. The table at QRTB2 will contain the scaling factor for the unit rates that relate to a respective month. Both of these tables will be 63 words in length.

### III-H PRE-REPORTING PHASE

All the information from the Update Phase is input to the Pre-Reporting Phase. This includes the Updated PERT Cost master file items and the information selected from the User's PERT Time tape.

#### Input of PERT Time Record

To input a record from the PERT Time tape, the following calling sequence is used:

```
L TSX JM00, 4
L + 1 PZE L, 1, C
L + 2 Normal return
```

where the "1" indicates a time record, "L" is the location of the record, and "C" is the count. This information is used to create a Work Package/Activity Report record to be given to the JSORT routine. The information is also used to generate a Pseudo Time record for the charge number contained in the UCHG block. The Pseudo Time record is the summarized information of all the activities connected to the specific charge number.

#### Input of Complete PERT Cost Item

To input a complete PERT cost item (charge number, performing organization, and resource code information), the following calling sequence is used:

```
L TSX JM00, 4
L + 1 PZE L, 0, C
L + 2 Normal return
```

where the "0" indicates a PERT cost item, and "L" and "C" are the location and count of the resource code information. The charge number information will be found in UCHG, the performing organization will be in UPUN, the rainbow category and cost category in RCMC, and the Pseudo-Time information in UTIME. This information will generate the Type 3, Type 4, Type 5, and Type 6 records of the JSORT routine.

### Input of Partial PERT Cost Item

To input a partial PERT Cost item (only charge number information is available), the following calling sequence will be used:

|       |               |         |
|-------|---------------|---------|
| L     | TSX           | JM00, 4 |
| L + 1 | PZE           | 0, 2, 0 |
| L + 2 | Normal return |         |

where the "2" denotes a partial PERT Cost item. The charge number information will be found in UCHG, the Pseudo Time information in UTIME, and no performing organization, resource code, rainbow category, or cost category information is available. This information will generate the Type 3, 4, 5, and 6 records for JSORT.

### End of Data Condition

When all the PERT Cost information has been processed, control is given to the Pre-Reporting Phase with the following calling sequence:

|       |     |         |
|-------|-----|---------|
| L     | TSX | JM00, 4 |
| L + 1 | PZE | 0, 0, 0 |

where all zeros indicate the end-of-data condition. A cleanup is performed in the Pre-Reporting Phase and control is then given to the JSORT routine, where the information is sorted for input into the Intermediate Reporting Phase.

### Option C or E Condition

If the program is run under option "C" or "E", only Report 1 information is generated. On the end of data condition, the information is sorted and transferred to the Intermediate Reporting Phase.

### Pre-Reporting Phase Region Descriptions

(See following pages.)



Region JM00

**EXPLANATION OF REGION:**

To set up information for Work Package/Activity reports (1 and 2), Christmas Tree routine, and Reporting master file.

**CALLING SEQUENCE:**

L       TSX       JM00, 4  
L + 1   PZE       L, F, C  
L + 2   Normal return

**INPUT:**

UCHG   - Charge number information  
UPUN   - Performing organization information  
L, 0, C - Resource code information location  
L, 1, C - Individual time record location

**OUTPUT:**

Reports 1 and 2 to JSORT.  
Type 3, 4, 5, 6 records to JSORT.  
UTIME   - Pseudo-time information

**STORAGE USED:**

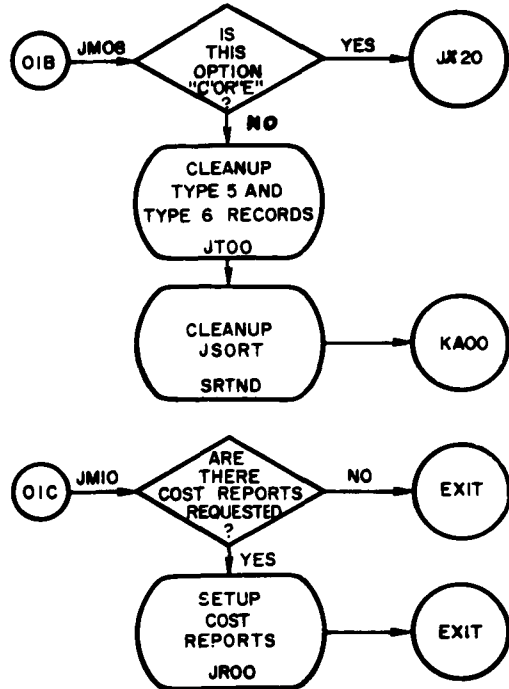
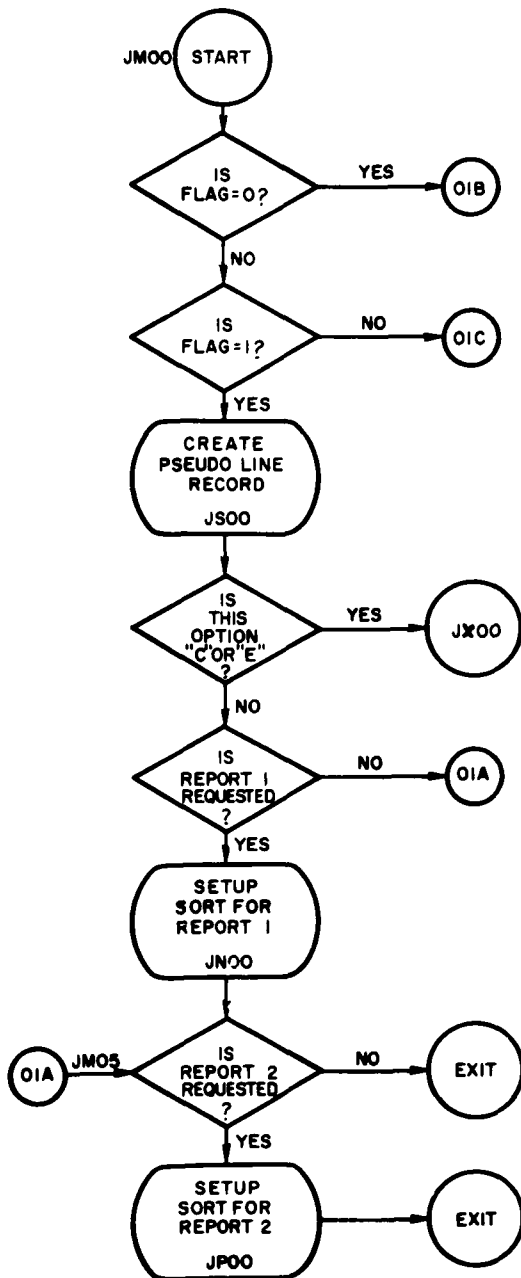
Not applicable

**SUBREGIONS AND SUBROUTINES USED:**

|      |       |
|------|-------|
| JN00 | JSORT |
| JP00 | JX00  |
| JR00 |       |

**EXPLANATION OF CALLING SEQUENCE:**

L = location of 1st word of block of information  
C = count of the number of items in block  
F = 0: L and C refer to resource code  
    = 1: L and C refer to individual time record  
    = 2: No resource code information available  
If L, C, and F are all zero, the end-of-data is indicated



Region JN00

EXPLANATION OF REGION:

To select information needed for producing Report 1 and give it to JSORT.

CALLING SEQUENCE:

L       TSX       JN00, 4

L + 1    Normal return

INPUT:

1.   Time record information
2.   Associated charge number information

OUTPUT:

Report 1 record

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

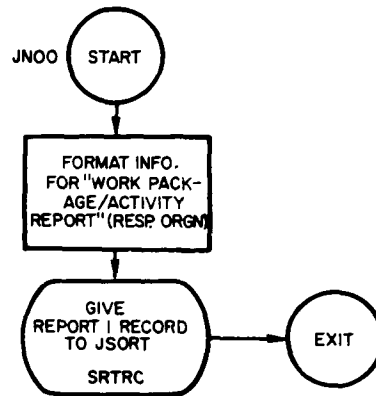
JSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable

REGION JN00

---



# RECORD FORMAT

PROGRAM NUMBER PERT COST

PAGE 1

NAME OF RECORD REPORT 1

|                    |                     |                          |                         |                      |               |                           |
|--------------------|---------------------|--------------------------|-------------------------|----------------------|---------------|---------------------------|
| DESCRIPTION        | WORD #1             | 2                        | 3                       | 4                    | 5             | 6                         |
|                    | REPORT NO.          | RESPONSIBLE ORGN.        | CHARGE NUMBER           |                      |               | PREDECESSOR EVENT         |
| CHARACTER LOCATION | 1 @ B35             | (6H)                     | (18H)                   |                      |               | (9H)                      |
| DESCRIPTION        | WORD 7              | 8                        | 9                       | 10                   | 11            | 12                        |
|                    | PRED. EVENT (CONT.) | SUCCESSOR EVENT          | CHARGE NUMBER           |                      |               | PREDECESSOR EVENT         |
| CHARACTER LOCATION |                     | (9H)                     | (18H)                   |                      |               | (9H)                      |
| DESCRIPTION        | WORD 13             | 14                       | 15                      | 16                   | 17            | 18                        |
|                    | PRED. EVENT (CONT.) | SUCCESSOR EVENT          | SCHED. EXP. COMPL. DATE | EXPECTED COMPL. DATE |               | SCHED. LATEST COMPL. DATE |
| CHARACTER LOCATION |                     | (9H)                     | D D M M Y Y             | D D M M Y Y          |               | D D M M Y Y               |
| DESCRIPTION        | WORD 19             | 20                       | 21                      | 22                   | 23            | 24                        |
|                    | LATEST COMPL. DATE  | SCHED/ACTUAL COMPL. DATE | SCHEDULED FLOW TIME     | EXPECTED FLOW TIME   | SLACK         | ACTIVITY DESCR.           |
| CHARACTER LOCATION | D D M M Y Y         | D D M M Y Y              | WK x 10 @ B35           | WK x 10 @ B35        | WK x 10 @ B35 | (54H)                     |
| DESCRIPTION        | WORD 25             | 26                       | 27                      | 28                   | 29            | 30                        |
|                    |                     |                          |                         |                      |               |                           |
| CHARACTER LOCATION |                     |                          |                         |                      |               |                           |

\* FIRST 7 WORDS ARE FOR SORTING PURPOSES ONLY

Fig. III-H-1. Tape Format of Report 1 Record

# RECORD FORMAT

PROGRAM NUMBER PERT COST

NAME OF RECORD REPORT 1 (CONT.)

PAGE 2

|                               |                 |                               |                    |                           |                      |
|-------------------------------|-----------------|-------------------------------|--------------------|---------------------------|----------------------|
| WORD 31                       | 32              | 33                            | 34                 | 35                        | 36                   |
| ACTIVITY DESCR.<br>(CONT.)    |                 | NETWORK<br>CODE               | NETWORK DESCRIPTOR |                           |                      |
|                               |                 | (6H)                          | (36H)              |                           |                      |
| CHARACTER LOCATION            |                 |                               |                    |                           |                      |
| WORD 37                       | 38              | 39                            | 40                 | 41                        | 42                   |
| NETWORK DESCRIPTOR<br>(CONT.) |                 |                               | TS/TA<br>INDICATOR | SCHED. EXP.<br>START DATE | RESPONSIBLE<br>ORGN  |
|                               |                 |                               | (1H)               | D D M M Y Y               | (6H)                 |
| CHARACTER LOCATION            |                 |                               |                    |                           |                      |
| WORD 43                       | 44              | 45                            | 46                 | 47                        | 48                   |
| CONTRACTOR<br>CODE            | CONTRACT NUMBER |                               | LEVEL<br>CODE      |                           | CHARGE NO.<br>DESCR. |
| (4H)                          |                 | (18H)                         | @ B35              |                           | (36H)                |
| CHARACTER LOCATION            |                 |                               |                    |                           |                      |
| WORD 49                       | 50              | 51                            | 52                 | 53                        |                      |
|                               |                 | CHARGE NO. DESCRIPTOR (CONT.) |                    |                           |                      |
| CHARACTER LOCATION            |                 |                               |                    |                           |                      |
| WORD                          |                 |                               |                    |                           |                      |
| CHARACTER LOCATION            |                 |                               |                    |                           |                      |

Fig. III-H-1. Tape Format of Report 1 Record (Continued)

Region JP00

**EXPLANATION OF REGION:**

To select information needed for producing Report 2 and give it to JSORT.

**CALLING SEQUENCE:**

L       TSX       JP00, 4

L + 1    Normal return

**INPUT:**

1.    Time record information
2.    Associated charge number information

**OUTPUT:**

Report 2 record

**STORAGE USED:**

Not applicable

**SUBREGIONS AND SUBROUTINES USED:**

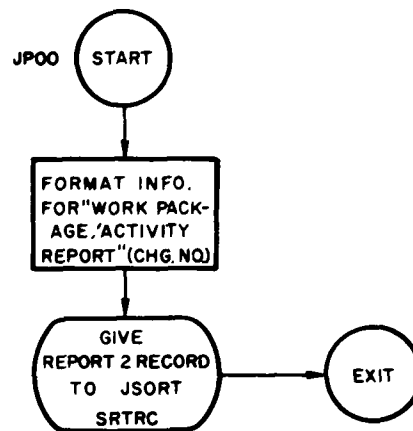
JSORT

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable

REGION - JPOO

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# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 2

|                             |                         |                    |                      |    |                    |
|-----------------------------|-------------------------|--------------------|----------------------|----|--------------------|
| WORD 1                      | 2                       | 3                  | 4                    | 5  | 6                  |
| REPORT NO.                  | CHARGE NUMBER           |                    | PREDECESSOR EVENT    |    |                    |
| 2 @ B35                     | (18H)                   |                    | 9H                   |    |                    |
| WORD 7                      | 8                       | 9                  | 10                   | 11 | 12                 |
| SUCCESSOR EVENT             | CHARGE NUMBER           |                    | PRODECESSOR EVENT    |    |                    |
| (9H)                        | (18H)                   |                    | (9H)                 |    |                    |
| WORD 13                     | 14                      | 15                 | 16                   | 17 | 18                 |
| SUCCESSOR EVENT             | SCHED. EXP. COMPL. DATE |                    | EXPECTED COMPL. DATE |    | LATEST COMPL. DATE |
| (9H)                        | D D M M Y Y             |                    | D D M M Y Y          |    | D D M M Y Y        |
| WORD 19                     | 20                      | 21                 | 22                   | 23 | 24                 |
| SCHED/ACTUAL COMPL. DATE    | SCHEDULED FLOW TIME     | EXPECTED FLOW TIME | SLACK                |    | ACTIVITY DESCR.    |
| D D M M Y Y                 | WK x 10 @ B35           | WK x 10 @ B35      | WK x 10 @ B35        |    | (54H)              |
| WORD 25                     | 26                      | 27                 | 28                   | 29 | 30                 |
| ACTIVITY DESCRIPTOR (CONT.) |                         |                    |                      |    |                    |
|                             |                         |                    |                      |    |                    |
|                             |                         |                    |                      |    |                    |
|                             |                         |                    |                      |    |                    |

\* THE FIRST 7 WORD ARE FOR SORTING PURPOSES ONLY.

Fig. III-H-2. Tape Format of Report 2 Record

# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 2

NAME OF RECORD REPORT 2 (CONT.)

|                    |                               |                 |                        |                       |            |
|--------------------|-------------------------------|-----------------|------------------------|-----------------------|------------|
| WORD 31            | 32                            | 33              | 34                     | 35                    | 36         |
| DESCRIPTION        | NETWORK CODE                  |                 | NETWORK DESCRIPTOR     |                       |            |
| CHARACTER LOCATION | (6H)                          |                 |                        |                       |            |
| WORD 37            | 38                            | 39              | 40                     | 41                    | 42         |
| DESCRIPTION        | NETWORK DESCR. (CONT.)        | TS/TA INDICATOR | SCHED. EXP. START DATE | RESPONSIBLE ORGN.     | CONTRACTOR |
| CHARACTER LOCATION |                               | (1H)            | D D M M Y Y            | (6H)                  | (4H)       |
| WORD 43            | 44                            | 45              | 46                     | 47                    | 48         |
| DESCRIPTION        | CONTRACT NUMBER               |                 | LEVEL CODE             | CHARGE NO. DESCRIPTOR |            |
| CHARACTER LOCATION | (18H)                         |                 | 0835                   | (36H)                 |            |
| WORD 49            | 50                            | 51              | 52                     |                       |            |
| DESCRIPTION        | CHARGE NO. DESCRIPTOR (CONT.) |                 |                        |                       |            |
| CHARACTER LOCATION |                               |                 |                        |                       |            |
| WORD               |                               |                 |                        |                       |            |
| DESCRIPTION        |                               |                 |                        |                       |            |
| CHARACTER LOCATION |                               |                 |                        |                       |            |

Fig. III-H-2. Tape Format of Report 2 Record (Continued)

Region JR00

**EXPLANATION OF REGION:**

To set up information for Christmas Tree routine and Reporting master file, and give it to JSORT.

**CALLING SEQUENCE:**

L        TSX        JR00, 4

L + 1    Normal return

**INPUT:**

UCHG - Charge number information

UPUN - Performing organization information

QRES1 - Resource code information

UTIME - Pseudo-time information

**OUTPUT:**

Type 3, 4, 5, 6 records for JSORT

**STORAGE USED:**

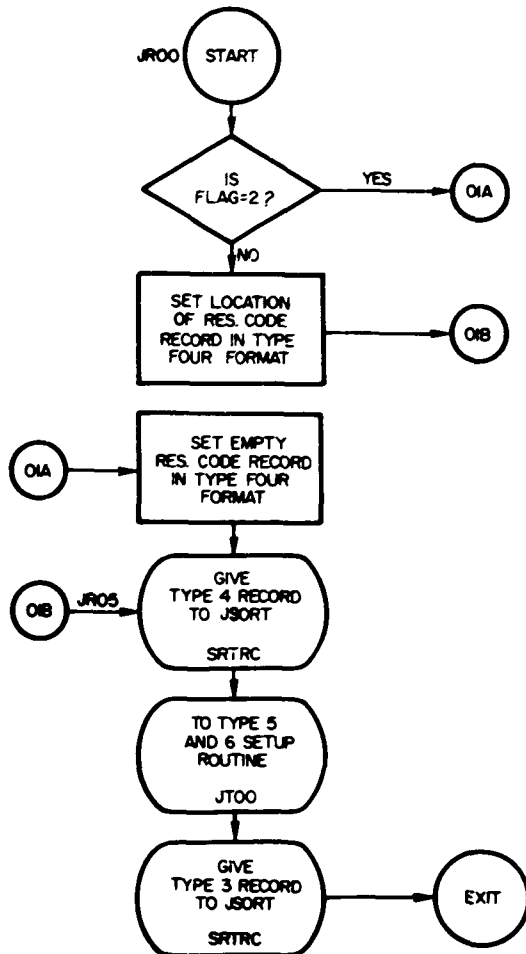
Not applicable

**SUBREGIONS AND SUBROUTINES USED:**

JSORT    JT00

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable



NAME OF RECORD TYPE 3

PAGE

The diagram illustrates a magnetic tape format with six rows of data. Each row is divided into fields labeled 1 through 10. Fields 1, 3, 5, and 7 are labeled 'WORD'. Fields 2, 4, 6, 8, and 10 are labeled 'CHARACTER LOCATION'. Fields 1, 3, 5, and 7 contain text: 'RECORD TYPE', '3 @ B35', 'CHARGE NO. DESCRIPTOR (CONT.)', and 'CHARGE NO. DESCRIPTOR' respectively. Fields 2, 4, 6, 8, and 10 contain binary data represented by horizontal lines with vertical spikes. Fields 3 and 5 are labeled '(18M)' and '(36M)' respectively.

| Field | Label              | Content                       |
|-------|--------------------|-------------------------------|
| 1     | WORD               | RECORD TYPE                   |
| 2     | CHARACTER LOCATION | [Binary Data]                 |
| 3     | WORD               | 3 @ B35 (18M)                 |
| 4     | CHARACTER LOCATION | [Binary Data]                 |
| 5     | WORD               | CHARGE NO. DESCRIPTOR (36M)   |
| 6     | CHARACTER LOCATION | [Binary Data]                 |
| 7     | WORD               | CHARGE NO. DESCRIPTOR (CONT.) |
| 8     | CHARACTER LOCATION | [Binary Data]                 |
| 9     | WORD               | [Blank]                       |
| 10    | CHARACTER LOCATION | [Binary Data]                 |

**Fig. III-H-3. Tape Format of Type 3 Record**

# RECORD FORMAT

PROGRAM NUMBER PERT COST

PAGE

NAME OF RECORD TYPE 4

|                    | WORD 1      | 2 | 3                    | 4 | 5 | N                                                |
|--------------------|-------------|---|----------------------|---|---|--------------------------------------------------|
| DESCRIPTION        | RECORD TYPE |   | NEXT HIGHER RELATION |   |   | REMAINING INFORMATION (SEE "REPORT INFO RECORD") |
| CHARACTER LOCATION | 4 @ B35     |   | (IBH)                |   |   |                                                  |
| DESCRIPTION        |             |   |                      |   |   |                                                  |
| CHARACTER LOCATION |             |   |                      |   |   |                                                  |
| DESCRIPTION        |             |   |                      |   |   |                                                  |
| CHARACTER LOCATION |             |   |                      |   |   |                                                  |
| DESCRIPTION        |             |   |                      |   |   |                                                  |
| CHARACTER LOCATION |             |   |                      |   |   |                                                  |
| DESCRIPTION        |             |   |                      |   |   |                                                  |
| CHARACTER LOCATION |             |   |                      |   |   |                                                  |
| DESCRIPTION        |             |   |                      |   |   |                                                  |
| CHARACTER LOCATION |             |   |                      |   |   |                                                  |

Fig. III-H-4. Tape Format of Type 4 Record

# RECORD FORMAT

PAGE

PROGRAM NUMBER PERT COST

NAME OF RECORD TYPE 5

|                    |      |             |                      |   |   |
|--------------------|------|-------------|----------------------|---|---|
|                    | WORD | 1           | 2                    | 3 | 4 |
| DESCRIPTION        |      | RECORD TYPE | NEXT HIGHER RELATION |   |   |
| CHARACTER LOCATION |      | 5 @ 835     | (18H)                |   |   |
| DESCRIPTION        | WORD |             |                      |   |   |
| CHARACTER LOCATION |      |             |                      |   |   |
| DESCRIPTION        | WORD |             |                      |   |   |
| CHARACTER LOCATION |      |             |                      |   |   |
| DESCRIPTION        | WORD |             |                      |   |   |
| CHARACTER LOCATION |      |             |                      |   |   |
| DESCRIPTION        | WORD |             |                      |   |   |
| CHARACTER LOCATION |      |             |                      |   |   |
| DESCRIPTION        | WORD |             |                      |   |   |
| CHARACTER LOCATION |      |             |                      |   |   |

Fig. III-H-5. Tape Format of Type 5 Record

# RECORD FORMAT

PROGRAM NUMBER PERT COST

PAGE

NAME OF RECORD TYPE 6

|                    |             |               |                      |
|--------------------|-------------|---------------|----------------------|
| DESCRIPTION        | RECORD TYPE | CHARGE NUMBER | NEXT HIGHER RELATION |
| CHARACTER LOCATION | 6 @ 835     | (18M)         | (18M)                |
| DESCRIPTION        | LEVEL       |               |                      |
| CHARACTER LOCATION | @ 835       |               |                      |
| DESCRIPTION        |             |               |                      |
| CHARACTER LOCATION |             |               |                      |
| DESCRIPTION        |             |               |                      |
| CHARACTER LOCATION |             |               |                      |
| DESCRIPTION        |             |               |                      |
| CHARACTER LOCATION |             |               |                      |
| DESCRIPTION        |             |               |                      |
| CHARACTER LOCATION |             |               |                      |

Fig. III-H-6. Tape Format of Type 6 Record



Region JS00

EXPLANATION OF REGION:

To create and update pseudo time-record.

CALLING SEQUENCE:

L       TSX       JS00, 4

L + 1    Normal return

INPUT:

Address of JM900 contains start of time record.

OUTPUT:

Pseudo-time record starting in UTIME.

STORAGE USED:

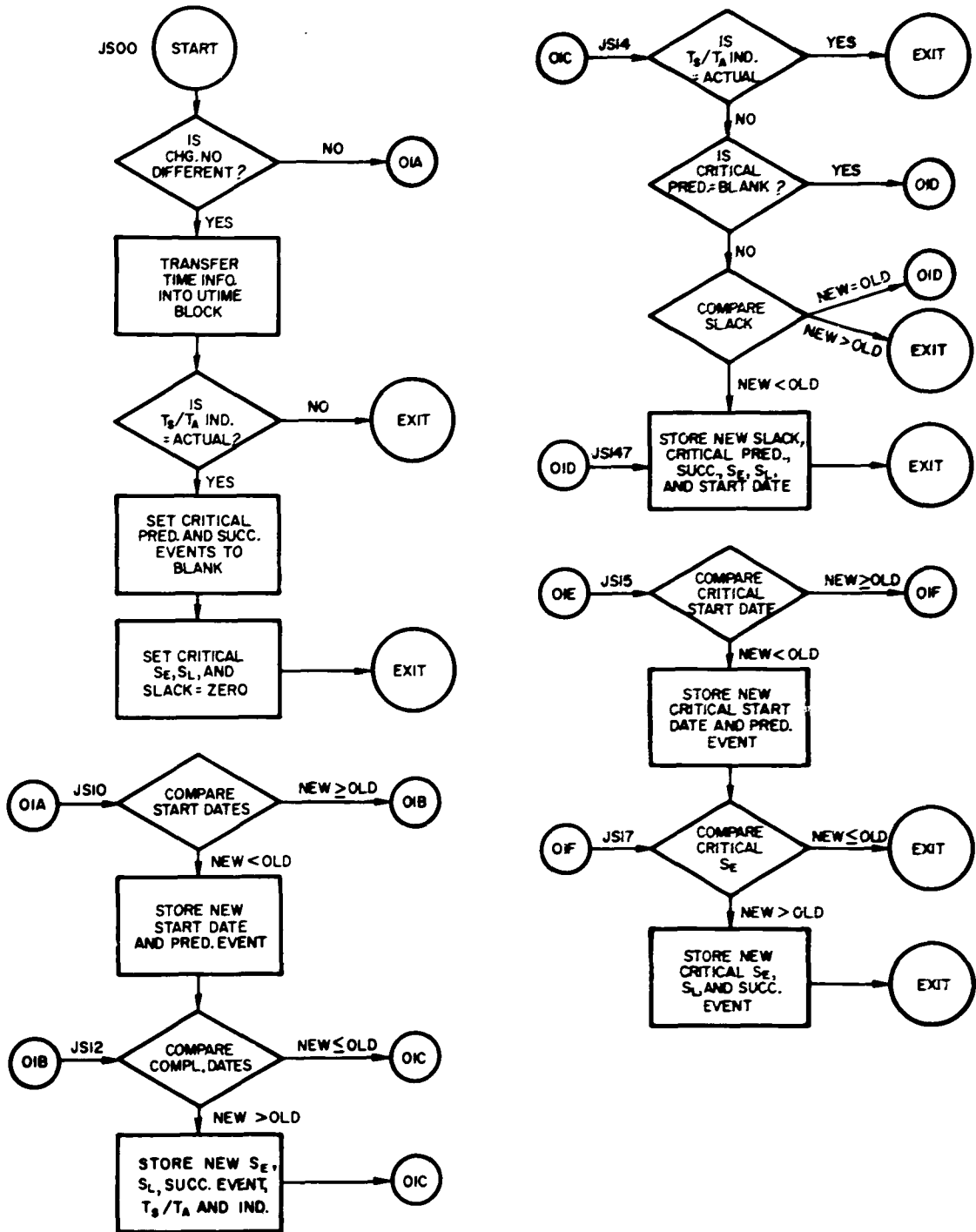
Not applicable

SUBREGIONS AND SUBROUTINES USED:

YDCMP    YCOMP

EXPLANATION OF CALLING SEQUENCE:

Not applicable



# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE  
 NAME OF RECORD SUM 1 TAPE

|                    | 1                       | 2                                                    | 3 | 4 | 5             | 6 |
|--------------------|-------------------------|------------------------------------------------------|---|---|---------------|---|
| DESCRIPTION        | LEVEL                   | NEXT HIGHER RELATION<br>(2'S COMPLEMENT FOR SORTING) |   |   | CHARGE NUMBER |   |
| CHARACTER LOCATION | @ 835                   | (18H)                                                |   |   | (18H)         |   |
| DESCRIPTION        | CHARGE<br>NO.<br>(CONT) | SON<br>COUNT                                         |   |   |               |   |
| CHARACTER LOCATION | @ 835                   |                                                      |   |   |               |   |
| DESCRIPTION        |                         |                                                      |   |   |               |   |
| CHARACTER LOCATION |                         |                                                      |   |   |               |   |
| DESCRIPTION        |                         |                                                      |   |   |               |   |
| CHARACTER LOCATION |                         |                                                      |   |   |               |   |
| DESCRIPTION        |                         |                                                      |   |   |               |   |
| CHARACTER LOCATION |                         |                                                      |   |   |               |   |
| DESCRIPTION        |                         |                                                      |   |   |               |   |
| CHARACTER LOCATION |                         |                                                      |   |   |               |   |

Fig. III-H-7. Tape Format of Pseudo Time Record

Region JT00

**EXPLANATION OF REGION:**

To set up Record Types 5 and 6 and give them to JSORT

**CALLING SEQUENCE:**

L       TSX       JT00, 4

L + 1    Normal return

**INPUT:**

UCHG - Charge number information

**OUTPUT:**

Types 5 and 6 records for JSORT

**STORAGE USED:**

Not applicable

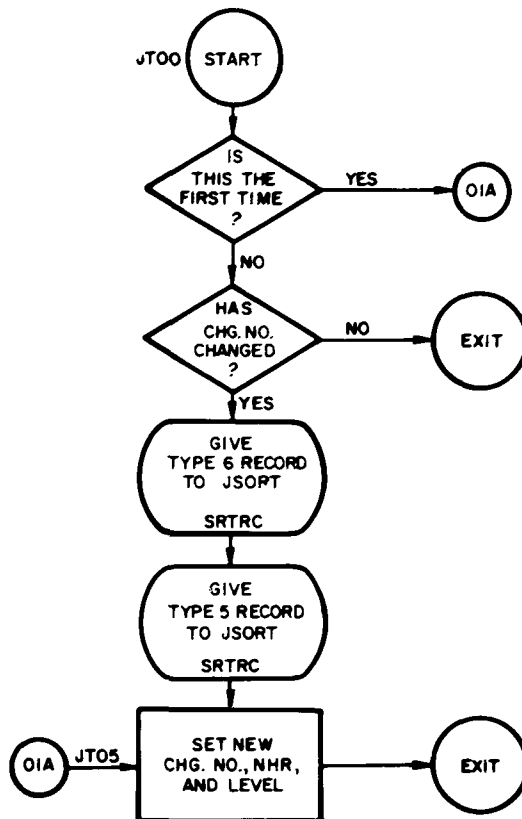
**SUBREGIONS AND SUBROUTINES USED:**

JSORT

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable

REGION JTOO



Region JX00

EXPLANATION OF REGION:

To select information needed for producing Report 1. On end of data condition, sort the information and transfer control to Intermediate Reporting Phase.

CALLING SEQUENCE:

L        TRA        JX00

INPUT:

1.     Time information
2.     Associated charge number information

OUTPUT:

Report 1 record.

STORAGE USED:

Not applicable

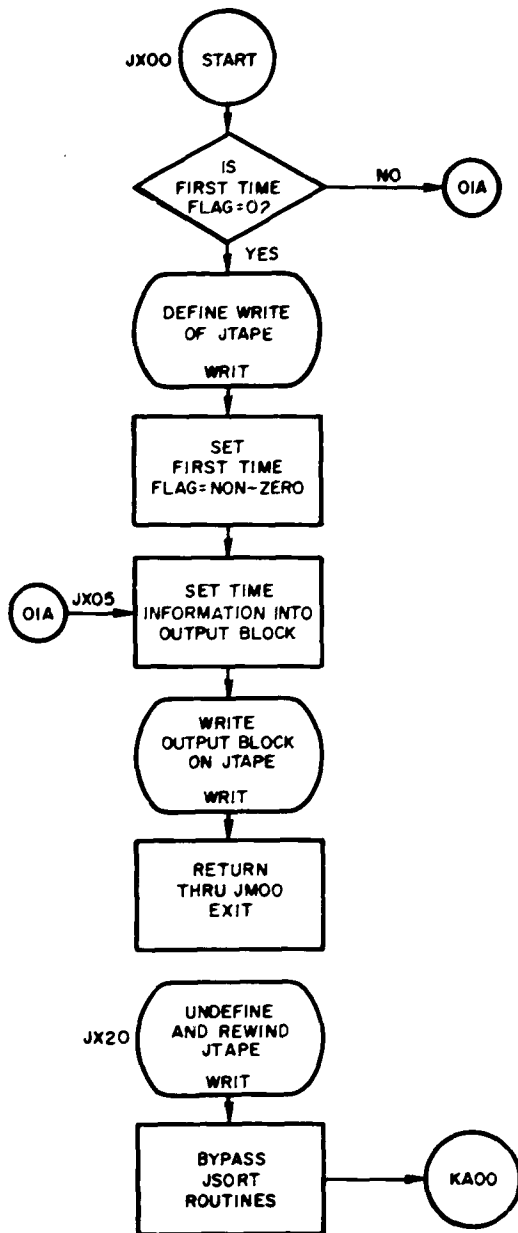
SUBREGIONS AND SUBROUTINES USED:

SORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable

REGION JX00



### III-I INTERMEDIATE REPORTING PHASE

In the Intermediate Reporting Phase the Work Package/Activity Reports (if requested) are generated on the output tape, the Christmas Tree Indicators for the Work Breakdown structure are generated, and the information necessary for the construction of the specified reports is gathered for input into the Final Reporting Phase.

#### No Reports or Time Reports Only

If no reports are selected, the processing will end in this phase with a message:

THERE WERE NO REPORTS PRODUCED DURING THIS  
RUN

If only Work Package/Activity Reports were selected, processing will end after these reports are generated.

#### Option C or E

If running under the control of option "C" or "E", processing will end after Report 1 is generated (Work Package/Activity Report with responsible organization as the major sort item).

#### Insertion of Next Higher Relation Descriptor

Since the descriptor of the "next higher relation" of the charge number is not readily available from the PERT Cost master file, and is necessary in the generation of the reports, it must be inserted into the Report Information master file. This is accomplished by generating a list of charge numbers and their descriptors sorted in charge number order (Type 3 record) and merging them with their "next higher relation" counterparts in the Cost Report file sorted by "next higher relation" (Type 4 record). The Cost Report file is then sorted back into charge number order. The sorted Cost Report file will be referred to as the FILE 1 tape.



## Christmas Tree Generation Routine

### General Description

The "Christmas Tree" routine is a method by which each charge number or summary number in the Work Breakdown Structure can be related to all its predecessor charge numbers (father, grandfather, etc.) and to all its successor charge numbers (sons, grandsons, etc.). The Christmas Tree Indicators which will be created will enable cost and time information to be summarized up the levels of the Work Breakdown structure to the charge numbers at the indicated reporting levels.

### Procedure

The Work Breakdown Structure of Fig. III-I-1 will be used to better illustrate the procedure necessary for the creation of the Christmas Tree Indicators. The charge number information, sorted with charge number major, will enter the routine as illustrated in Table III-I-1.

Table III-I-1  
Data Sorted by Charge Number (Son)

| Charge No.<br>(Son) | Next Higher Relation<br>(Father) | Level | Related<br>Information |
|---------------------|----------------------------------|-------|------------------------|
| 100                 | 000                              | 1     | -                      |
| 200                 | 100                              | 2     | -                      |
| 300                 | 100                              | 2     | -                      |
| 400                 | 100                              | 2     | -                      |
| 500                 | 200                              | 3     | -                      |
| 600                 | 200                              | 3     | -                      |
| 700                 | 400                              | 3     | -                      |
| 800                 | 400                              | 3     | -                      |
| 900                 | 500                              | 4     | -                      |
| 1000                | 600                              | 4     | -                      |
| 1100                | 300                              | 4     | -                      |
| 1200                | 800                              | 4     | -                      |

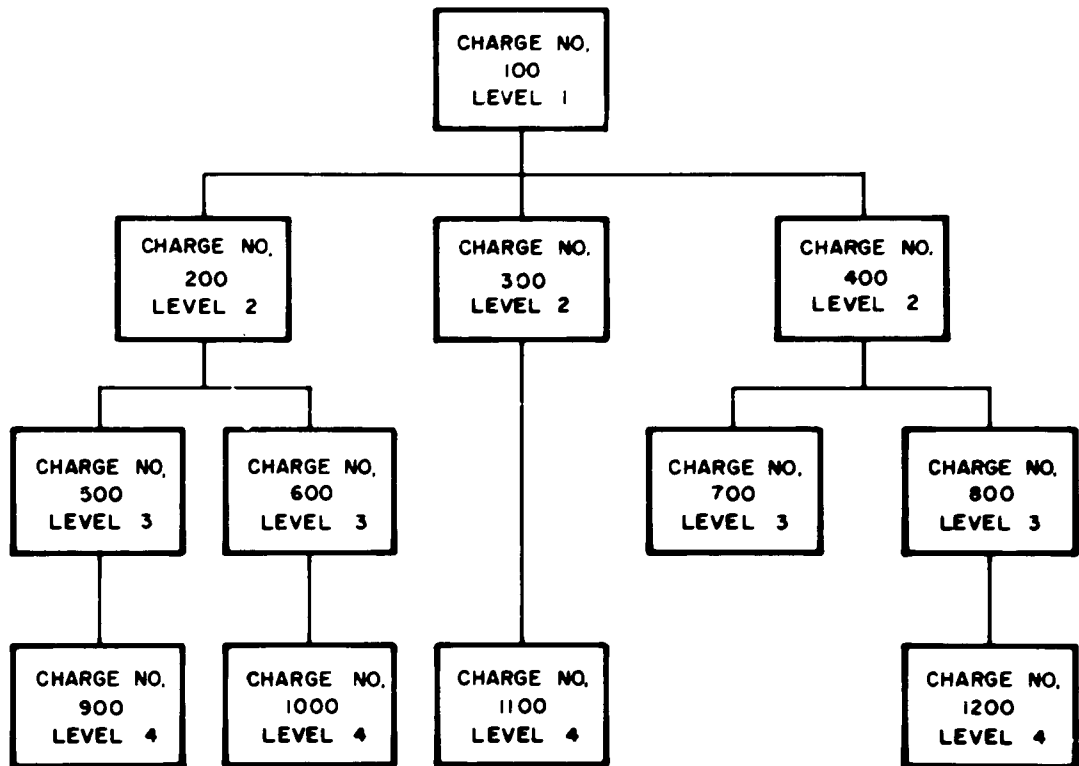


Figure III-I-1 - Sample Work Breakdown Structure

The "next higher relation" or father of each charge number will be retrieved from Table III-I-1 , placed into Table III-I-2 , and then sorted.

Table III-I-2

Father Sort

000  
100  
100  
100  
200  
200  
300  
400  
400  
500  
600  
800

The number of times each father appears in the table is then determined and the count is placed in Table III-I-3. This count will be the number of sons directly related to each individual charge number. Those charge numbers not appearing in Table III-I-3 will have zero sons.

Table III-I-3

Father-Son Count

| <u>Charge No.</u> | <u>Count</u> | <u>Charge No.</u> | <u>Count</u> |
|-------------------|--------------|-------------------|--------------|
| 000               | 1            | 400               | 2            |
| 100               | 3            | 500               | 1            |
| 200               | 2            | 600               | 1            |
| 300               | 1            | 800               | 1            |

The charge number, next higher relation, and level information from Table III-I-1 is then merged with Table III-I-3 to form Table III-I-4. Table III-I-4 will be sorted with level major and father minor.

Table III-I-4

Data Sorted by Level and by Father

| Item No. | Level | Son  | Father | Count |
|----------|-------|------|--------|-------|
| 1        | -     | 000  | -      | 1     |
| 2        | 1     | 100  | 000    | 3     |
| 3        | 2     | 200  | 100    | 2     |
| 4        | 2     | 300  | 100    | 1     |
| 5        | 2     | 400  | 100    | 2     |
| 6        | 3     | 500  | 200    | 1     |
| 7        | 3     | 600  | 200    | 1     |
| 8        | 3     | 700  | 400    | 0     |
| 9        | 3     | 800  | 400    | 1     |
| 10       | 4     | 1100 | 300    | 0     |
| 11       | 4     | 900  | 500    | 0     |
| 12       | 4     | 1000 | 600    | 0     |
| 13       | 4     | 1200 | 800    | 0     |

A set of sixteen 6-bit indicators are formed to associate an individual charge number with all of its predecessor charge numbers. There will be one 6-bit indicator for each of the 16 levels possible. The set of 16 indicators forms one Christmas Tree Indicator.

#### Method of Generating Christmas Tree Indicators

- A. Get the first item (charge number record) from Table III-I-4 . Place the son (all zeros), count and a Christmas Tree Indicator (CTI) of all zeros into a "working table."
- B. Get the next charge number item from Table III-I-4
- C. Find the son in the working table that matches the father in the current charge number item. Decrease the count for this working table item by one.
- D. Get the CTI in the working table item and increase by one the  $L^{\text{th}}$  level indicator (i.e., the indicator pertaining to the level of the current charge number item).
- E. Place the son from the current charge number item and the new CTI in an output table.

- F. If the count of the working table item is zero, set the item in the Working Table to a "complete" condition.
- G. If the count of the current item in Table III-I-4 is non-zero, place the son, count, and new CTI into the Working Table, and return to step B. If the count is zero, return directly to step B.

#### Exception Messages

If the Working Table should become filled, the completed items will be removed and the table will be condensed to fill the vacant spaces. If there are no completed items to remove, the following message will be printed:

WORKING TABLE TOO SMALL

and the computer will halt.

#### Cleanup

When all the items in Table III-I-4 have been processed, the information in the Output Table is sorted on son (charge number) and then the CTI is merged with the information in Table III-I-5 to create a Pert Cost Reporting File. By sorting the PERT Cost Reporting File with CTI major, the Work Breakdown structure will be placed in a topological order from the top to the bottom. To invert this ordering, the CTI may be complemented (one's complement) prior to sorting.

If a charge number has a "next higher relation" that does not appear as a charge number elsewhere in the Work Breakdown Structure, the following message will be printed:

THE FOLLOWING SON HAS NO FATHER XXXXXX

When all the charge numbers of this type have been printed, the computer will halt.

#### Illustration of Christmas Tree Indicator Generation

The illustration of the generation of the CTI will utilize the data in Table III-I-4, and reference the steps given on Page III-I-5 under

"Method of Generating Christmas Tree Indicators." For reasons of space, only the first four indicators of the CTI will be shown in the illustration.

Step A

Place the son and count of item No. 1 along with a CTI of all zeros into the Working Table. The Working Table now contains:

| Son | Count | CTI             |
|-----|-------|-----------------|
| 000 | 1     | 00/00/00/00/... |

Step B

Get item 2 from Table III-I-4 , showing:

| Level | Son | Father | Count |
|-------|-----|--------|-------|
| 1     | 100 | 000    | 3     |

Step C

Find son 000 in the Working Table and decrease its count by 1. The Working Table now contains:

| Son | Count | CTI             |
|-----|-------|-----------------|
| 000 | 0     | 00/00/00/00/... |

Step D

Increase the first indicator of the CTI of the item in the Working Table by 1. The Working Table now contains:

| Son | Count | CTI             |
|-----|-------|-----------------|
| 000 | 0     | 01/00/00/00/... |

Step E

Place the son in item No. 2 of Table III-I-4 together with the new CTI from the Working Table into the Output Table. The Output Table now contains:

| Son | CTI             |
|-----|-----------------|
| 100 | 01/00/00/00/... |

#### Step F

Since the count of the item in the Working Table is now 0, the item will be set to a completed condition. The Working Table now contains:

| Son            | Count | CTI             |
|----------------|-------|-----------------|
| <del>000</del> | 0     | 01/00/00/00/... |

#### Step G

Since the count of item 2 in Table III-I-4 is non-zero, the son, count, and new CTI is placed in the Working Table. The Working Table now contains:

| Son            | Count | CTI             |
|----------------|-------|-----------------|
| <del>000</del> | 0     | 01/00/00/00/... |
| 100            | 3     | 01/00/00/00/... |

Control is now returned to Step B and the next charge number item in Table III-I-4 is processed.

#### Step B

Get item No. 3 from Table III-I-4 .

#### Step C

After the completion of this step, the Working Table will contain:

| Son            | Count | CTI             |
|----------------|-------|-----------------|
| <del>000</del> | 0     | 01/00/00/00/... |
| 100            | 2     | 01/00/00/00/... |

#### Step D

Upon the completion of this step the Working Table contains:

| Son            | Count | CTI             |
|----------------|-------|-----------------|
| <del>000</del> | 0     | 01/00/00/00/... |
| 100            | 2     | 01/01/00/00/... |

### Step E

Upon completion of this step the Output Table contains:

| Son | CTI             |
|-----|-----------------|
| 100 | 01/00/00/00/... |
| 200 | 01/01/00/00/... |

### Step F

The count of the Working Table item is non-zero, and the Working Table is unchanged.

### Step G

Upon completion of this step the Working Table contains:

| Son            | Count | CTI             |
|----------------|-------|-----------------|
| <del>000</del> | 0     | 01/00/00/00/... |
| 100            | 2     | 01/01/00/00/... |
| 200            | 2     | 01/01/00/00/... |

After all the items in Table III-I-4 have been processed, the Output Table will contain:

| Charge Number | CTI             |
|---------------|-----------------|
| 100           | 01/00/00/00/... |
| 200           | 01/01/00/00/... |
| 300           | 01/02/00/00/... |
| 400           | 01/03/00/00/... |
| 500           | 01/01/01/00/... |
| 600           | 01/01/02/00/... |
| 700           | 01/03/01/00/... |
| 800           | 01/03/02/00/... |
| 1100          | 01/02/00/01/... |
| 900           | 01/01/01/01/... |
| 1000          | 01/01/02/01/... |
| 1200          | 01/03/02/01/... |

### Intermediate Reporting Phase Region Descriptions

The region specifications are given on the following pages, together with corresponding report formats or tape record formats when appropriate.



Region KA00

EXPLANATION OF REGION:

This is the master control region for the Intermediate Reporting Phase, controlling output of time reports, Christmas Tree generation, and initial sort for remaining reports.

CALLING SEQUENCE:

L        TRA        KA00

INPUT:

Sorted PRE-REPORTING TAPE.

OUTPUT:

Reporting tape with information for generation of each report broken down by report and level.

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED

KB00

KC00

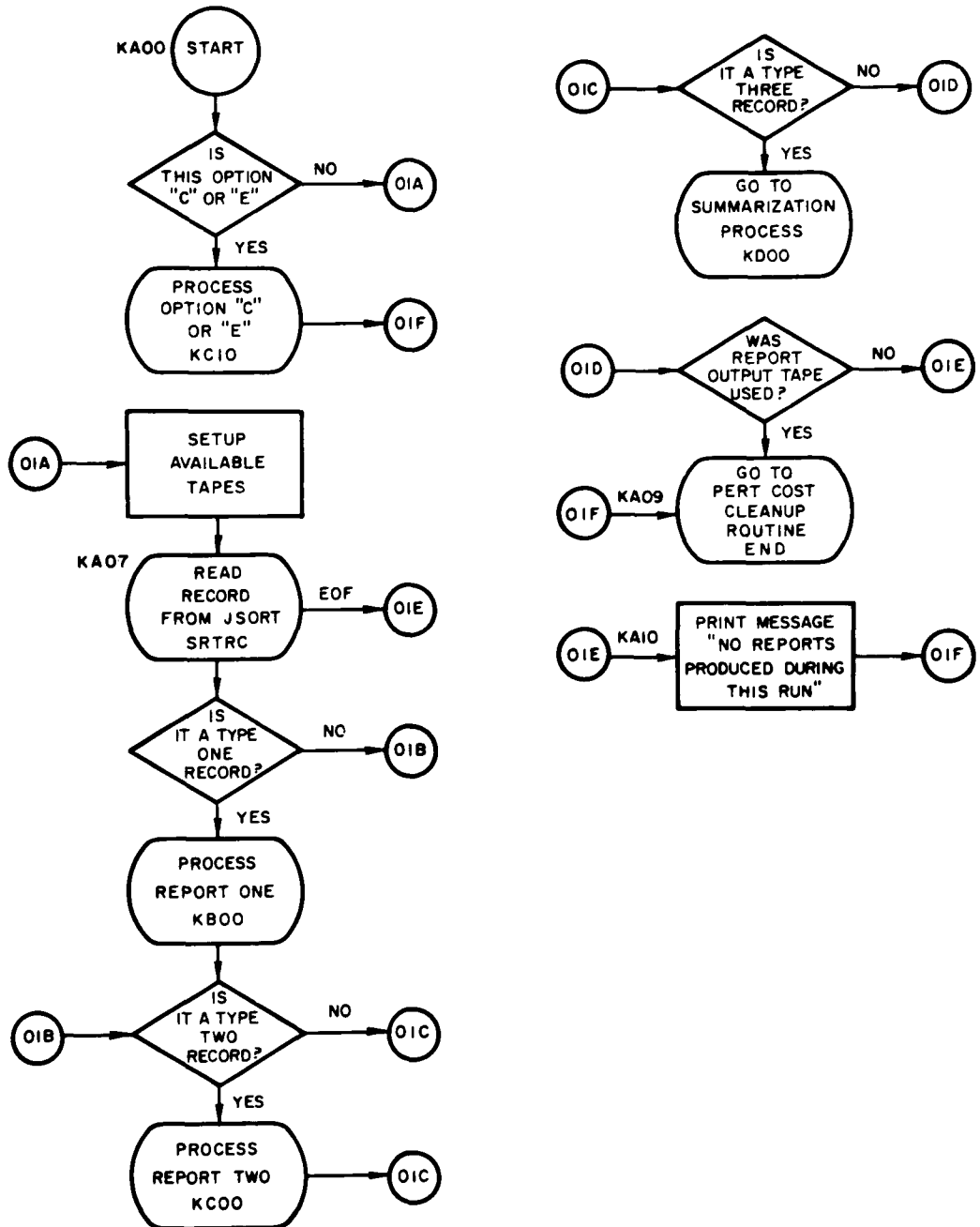
KC10

KD00

EXPLANATION OF CALLING SEQUENCE:

Not applicable

REGION KA00



Region KB00

EXPLANATION OF REGION:

To print Report No. 1, "Work Package/Activity." Sort sequence:  
responsible organization, charge number, predecessor charge number,  
successor charge number.

CALLING SEQUENCE:

L       TSX       KB00, 4  
L + 1    Normal return

INPUT:

First sorted item of information for report number 1 located in  
address of YCNT.

OUTPUT:

Report number 1 on OUTPUT REPORT TAPE.

STORAGE USED:

Not applicable

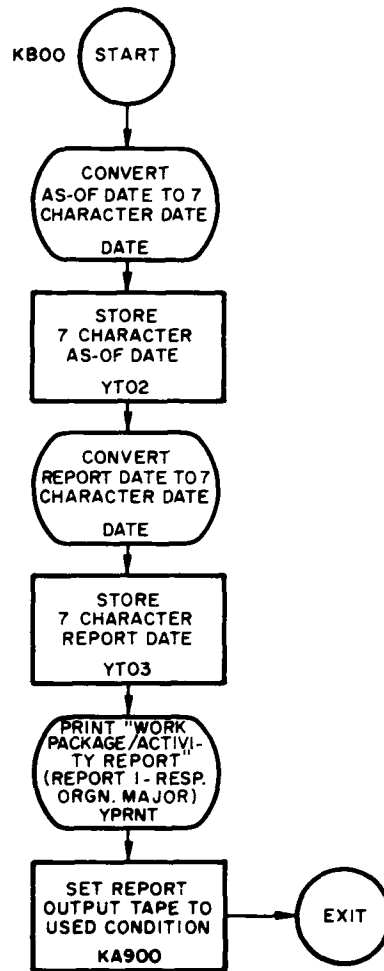
SUBREGIONS AND SUBROUTINES USED:

DATE           YPRNT

EXPLANATION OF CALLING SEQUENCE:

Not applicable

REGION KB00



Region KC00

EXPLANATION OF REGION:

To print report number 2, "Work Package/Activity." Sort sequence:  
charge number, predecessor number, successor number.

CALLING SEQUENCE:

L       TSX       KC00, 4  
L + 1    Normal return

INPUT:

First sorted item of information for report number 2 located in  
address of YCNT

OUTPUT:

Report number 2 on output report tape

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

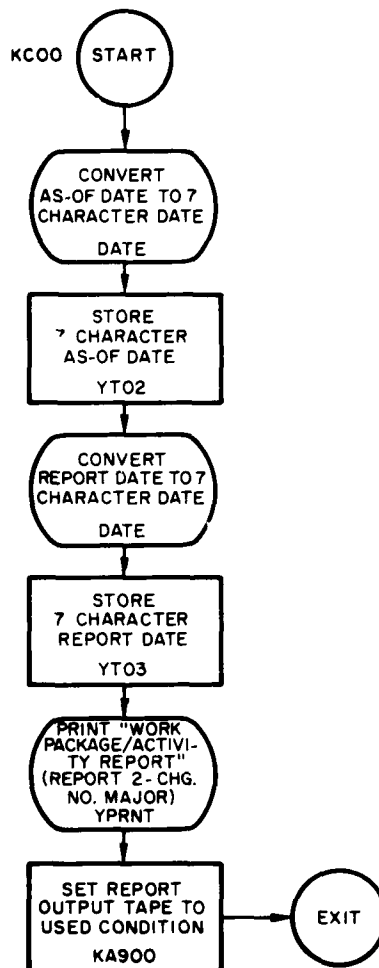
DATE               YPRNT

EXPLANATION OF CALLING SEQUENCE:

Not applicable

REGION KCOO

---



Region KC10

EXPLANATION OF REGION:

To print Report 1 under option "C" or "E."

CALLING SEQUENCE:

L        TRA        KC10

INPUT:

Report 1 information on JTAPE.

OUTPUT:

Report 1 on OUTPUT REPORT TAPE.

STORAGE USED:

Not applicable

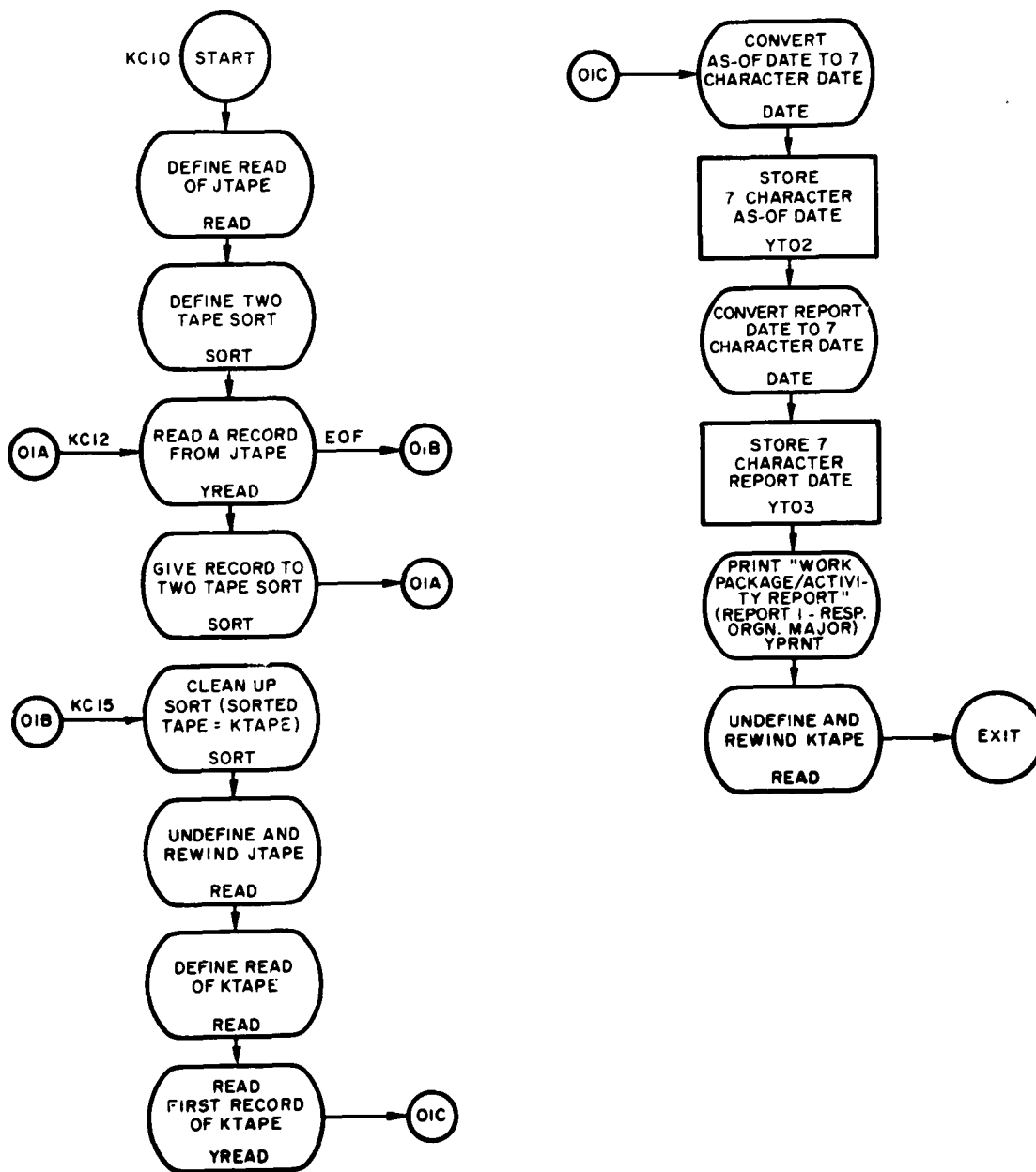
SUBREGIONS AND SUBROUTINES USED:

DATE    YPRINT    READ    SORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable

REGION KC10





### Region YPRNT

#### EXPLANATION OF REGION:

To print the "Work Package/Activity Report"

#### CALLING SEQUENCE:

L    TSX    YPRNT, 4  
L+1  PZE    T,,K  
L+2  PZE    R  
L+3  PZE    B,I,C  
L+4  PZE    L<sub>T</sub>,F,L<sub>B</sub>  
L+5  PZE    L,,N  
L+6  Normal return

#### INPUT:

Report 1 or 2 from Intermediate Report Tape

#### OUTPUT:

Report 1 or 2 on Output Report tape

#### STORAGE USED:

Not applicable.

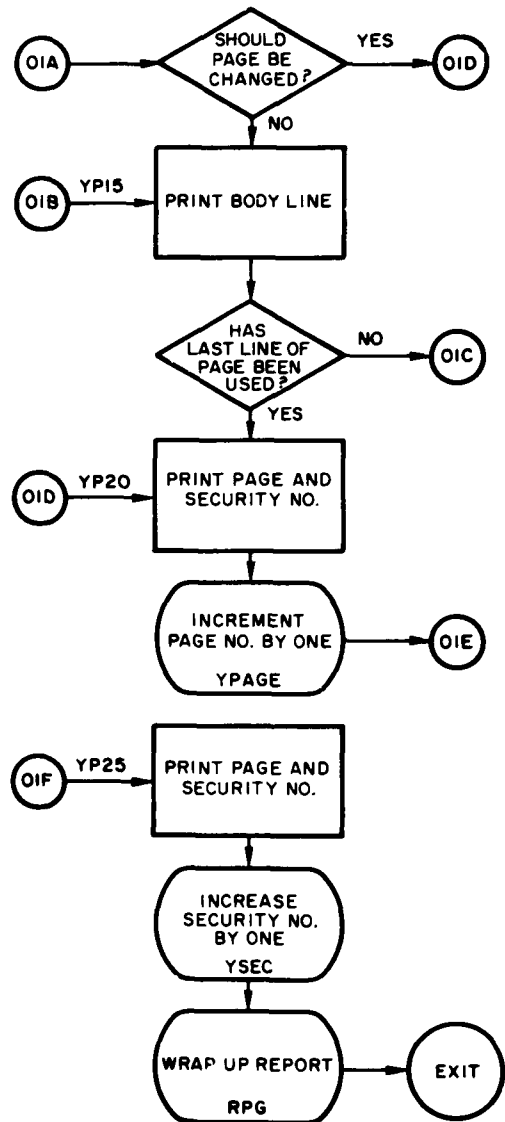
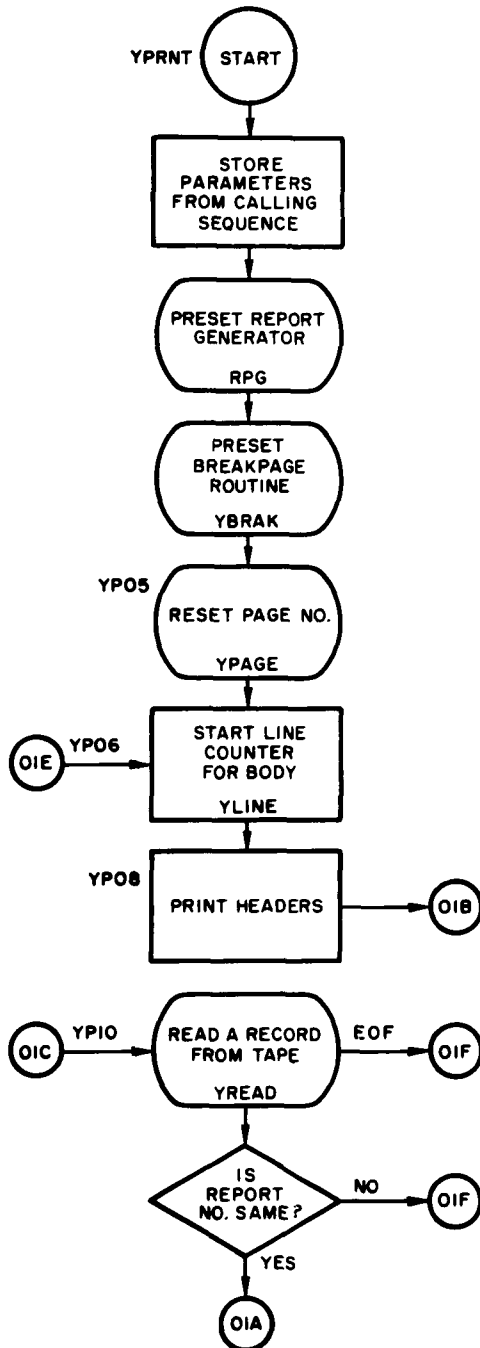
#### SUBREGIONS AND SUBROUTINES USED:

YBRAK       YPAGE       YSEC       YREAD

#### EXPLANATION OF CALLING SEQUENCE:

|     |                                                     |                |                                                          |
|-----|-----------------------------------------------------|----------------|----------------------------------------------------------|
| K   | = length of sort key                                | L <sub>T</sub> | = location of top header                                 |
| R   | = report number                                     | L <sub>B</sub> | = location of bottom title                               |
| B,I | = location of field for<br>break page               | L              | = location of body format<br>region                      |
| C   | = length of break page<br>field (words)             | N              | = number of lines allocated<br>to body portion of report |
| T   | = 0: read from J SORT tape<br>= X: read from tape X | F              | = 0: security No. not used<br>= 1: security No. used     |

# REGION YPRNT



Region KD00

EXPLANATION OF REGION:

Master control for summarization routines and report data breakdown.

CALLING SEQUENCE:

L       TSX       KD00, 4  
L + 1    Normal return

INPUT:

1.    Summarization routine information.
2.    PERT Cost master file in report form.

OUTPUT:

Reporting tape with report breakdown.

STORAGE USED:

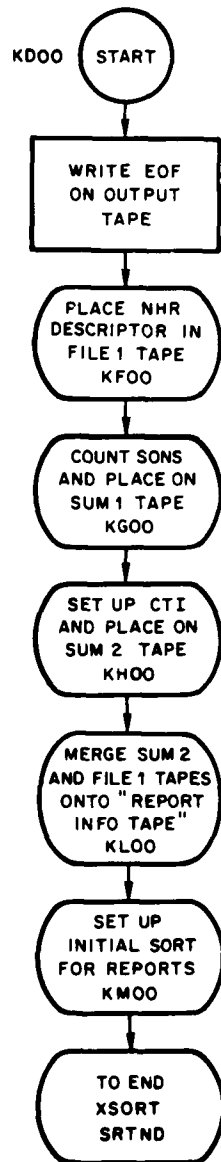
Not applicable

SUBREGIONS AND SUBROUTINES USED:

|      |      |
|------|------|
| KF00 | KL00 |
| KG00 | KM00 |
| KH00 |      |

EXPLANATION OF CALLING SEQUENCE:

Not applicable



Region KF00

EXPLANATION OF REGION:

To place the "next higher relation" description onto the FILE 1 tape.

CALLING SEQUENCE:

L       TSX       KF00, 4

L + 1    Normal return

INPUT:

1.    TYPE 3 record on JSORT tape.
2.    TYPE 4 record on JSORT tape.

OUTPUT:

FILE 1 tape

STORAGE USED:

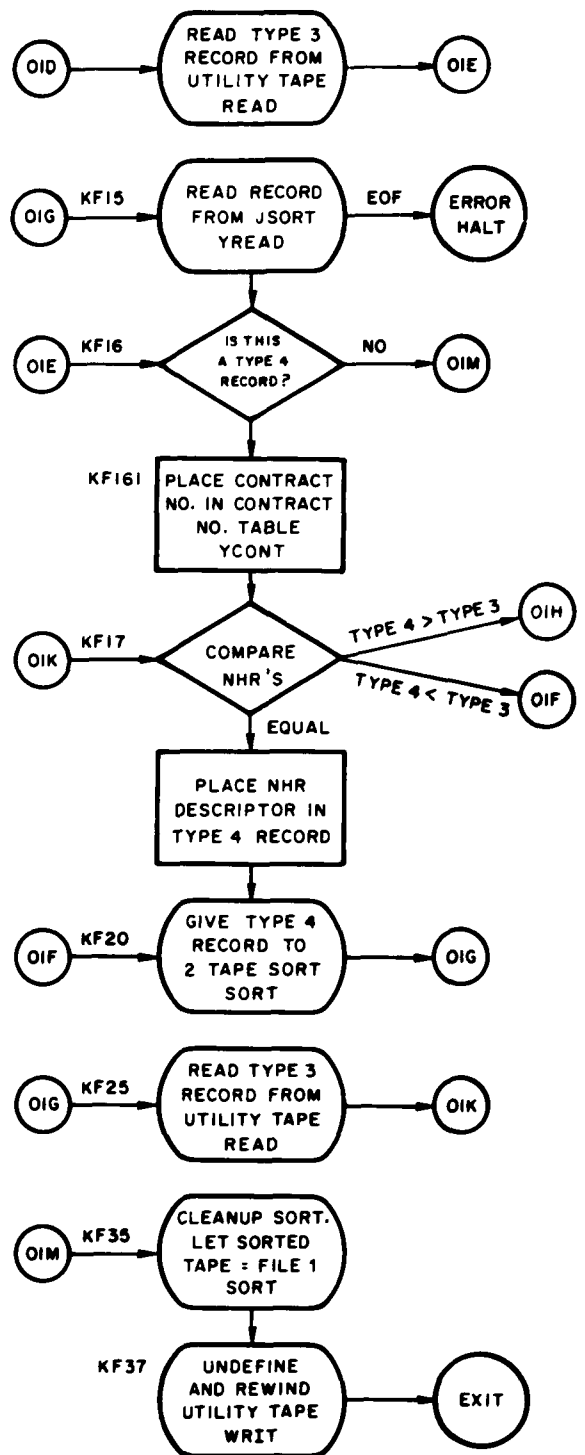
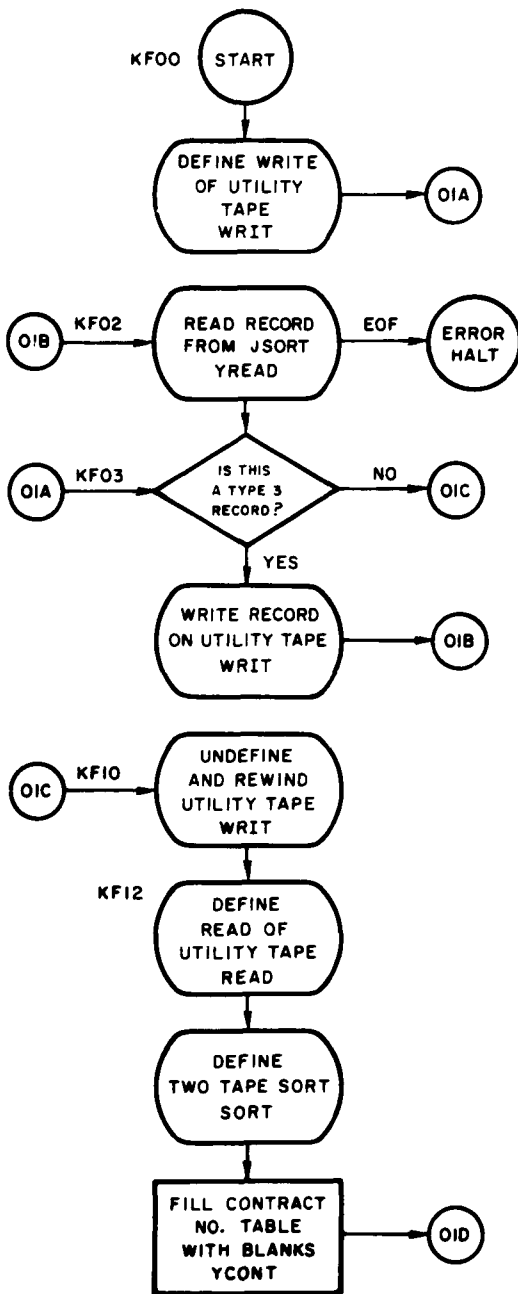
Not applicable

SUBREGIONS AND SUBROUTINES USED:

|      |       |
|------|-------|
| READ | YREAD |
| WRIT | YCOMP |
| SORT |       |

EXPLANATION OF CALLING SEQUENCE:

Not applicable



Region KG00

EXPLANATION OF REGION:

To count the number of sons for each charge number and place the counts on the SUM 1 tape.

CALLING SEQUENCE:

L       TSX       KG00, 4

L + 1    Normal return

INPUT:

1.    TYPE 5 record from JSORT tape.
2.    TYPE 6 record from JSORT tape.

OUTPUT:

SUM 1 tape.

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

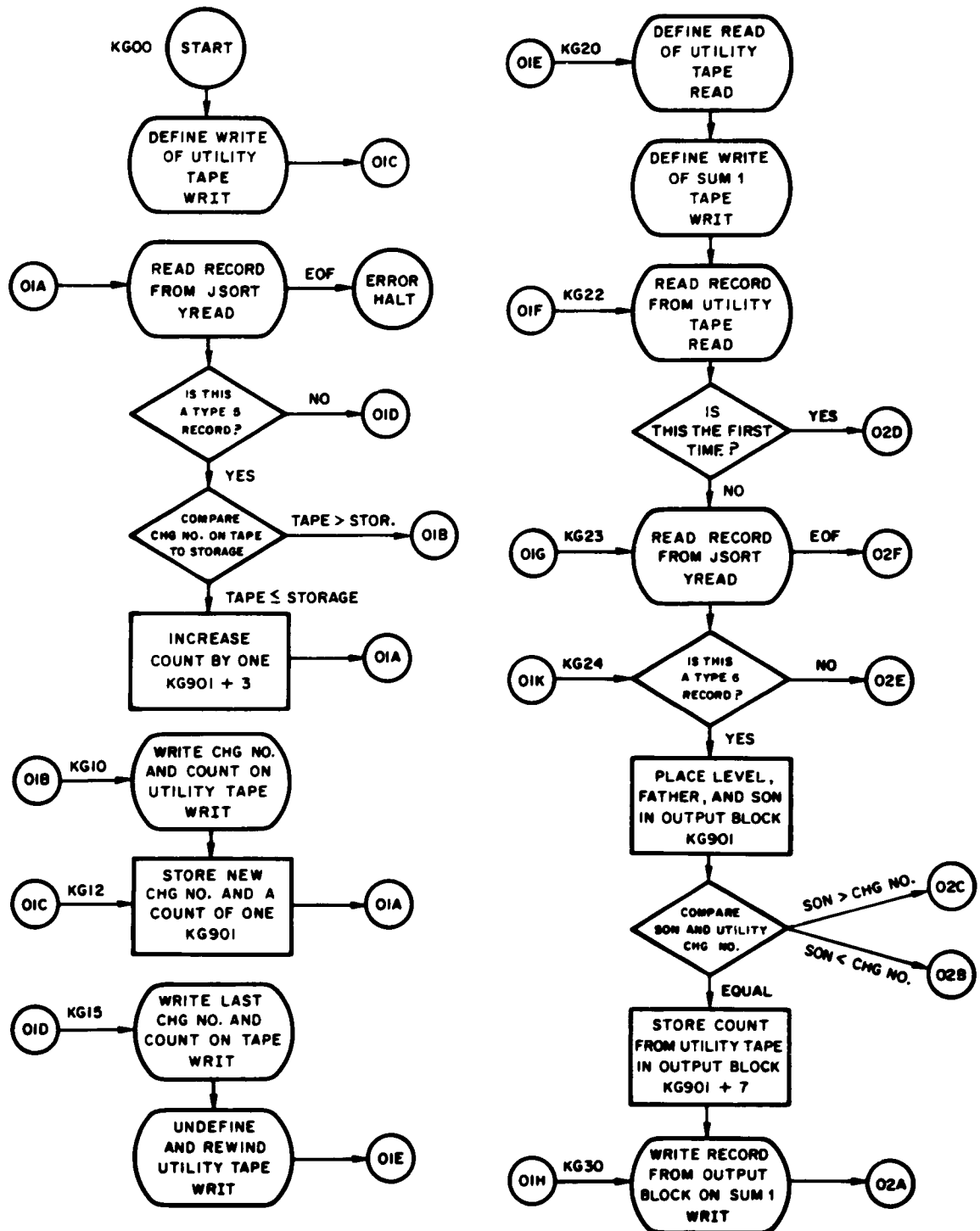
READ           YCOMP

WRIT           YREAD

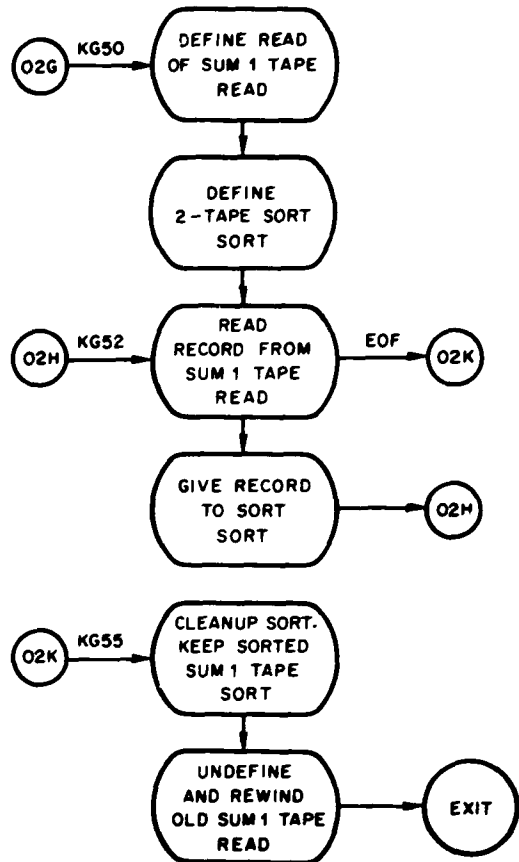
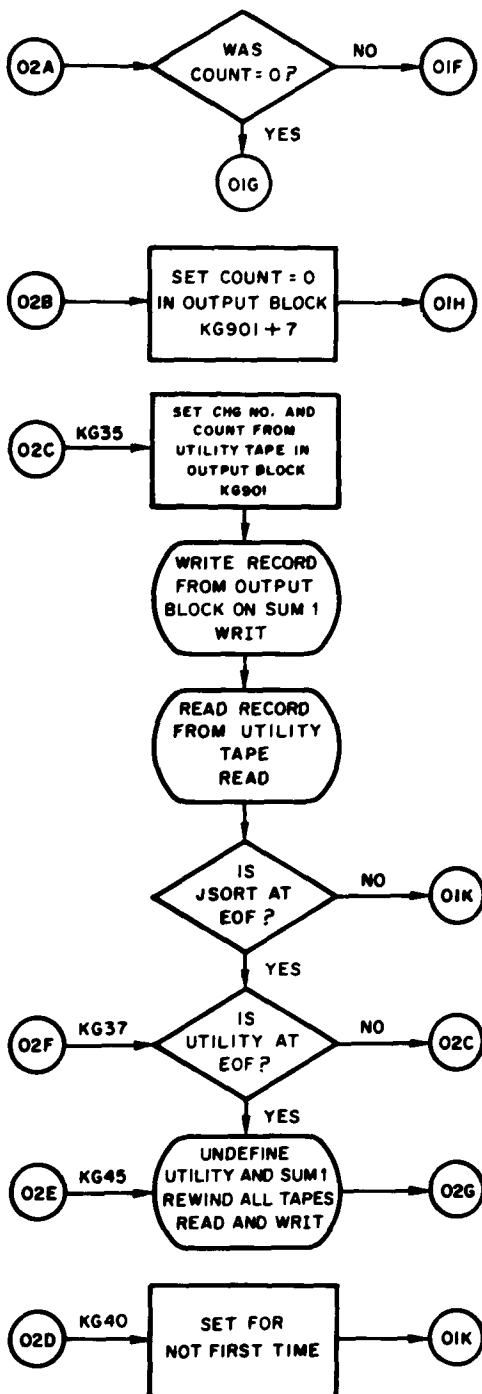
SORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable







# RECORD FORMAT

|                    |               |                          |        |        |        |
|--------------------|---------------|--------------------------|--------|--------|--------|
| PROGRAM NUMBER     |               | PERT COST                |        | PAGE   |        |
| NAME OF RECORD     |               | WORKING TABLE            |        |        |        |
| DESCRIPTION        | WORD 1        | WORD 2                   | WORD 3 | WORD 4 | WORD 5 |
| CHARACTER LOCATION | CHARGE NUMBER |                          |        |        |        |
|                    | (18H)         |                          |        |        |        |
| DESCRIPTION        | WORD 7        | SON COUNT                |        |        |        |
| CHARACTER LOCATION | 0835          |                          |        |        |        |
| DESCRIPTION        | WORD          | CHRISTMAS TREE INDICATOR |        |        |        |
| CHARACTER LOCATION | (18H)         |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
| DESCRIPTION        | WORD          |                          |        |        |        |
| CHARACTER LOCATION |               |                          |        |        |        |
|                    |               |                          |        |        |        |

Fig. III-I-2 Format of SUM1 Tape Record

Region KH00

**EXPLANATION OF REGION:**

To set-up Christmas Tree Indicators and place them on SUM 2 tape in charge number order.

**CALLING SEQUENCE:**

L       TSX       KH00, 4  
L + 1    Normal return

**INPUT:**

SUM 1 tape.

**OUTPUT:**

SUM 2 tape

**STORAGE USED:**

Working table - 5000 Words  
Output table - 6 Words

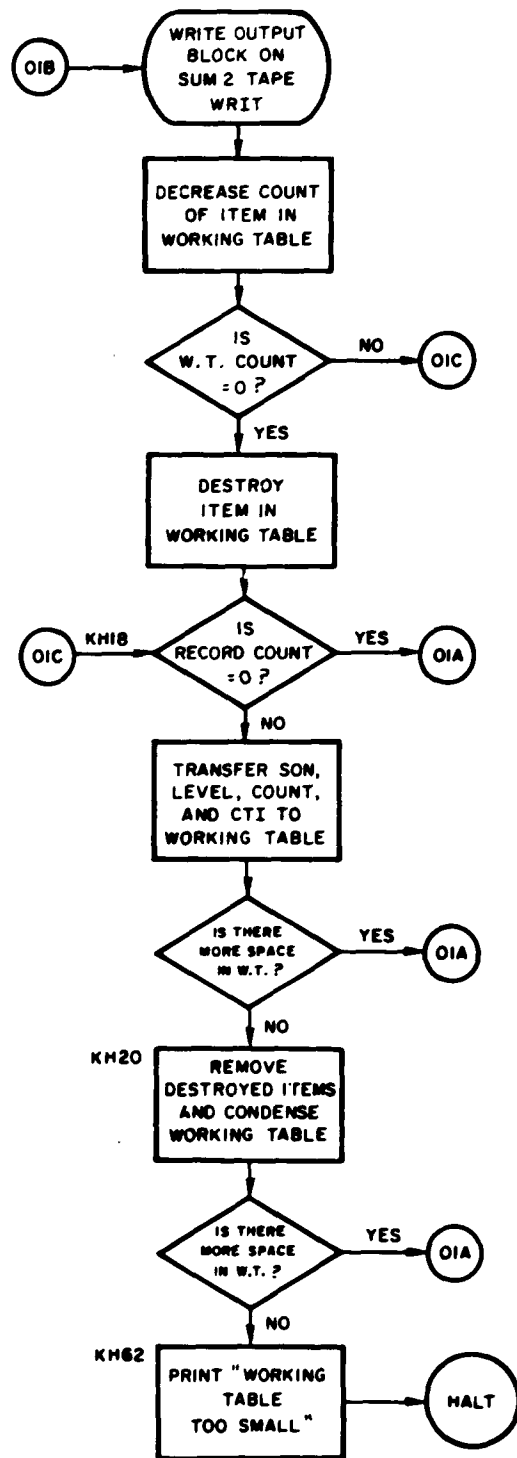
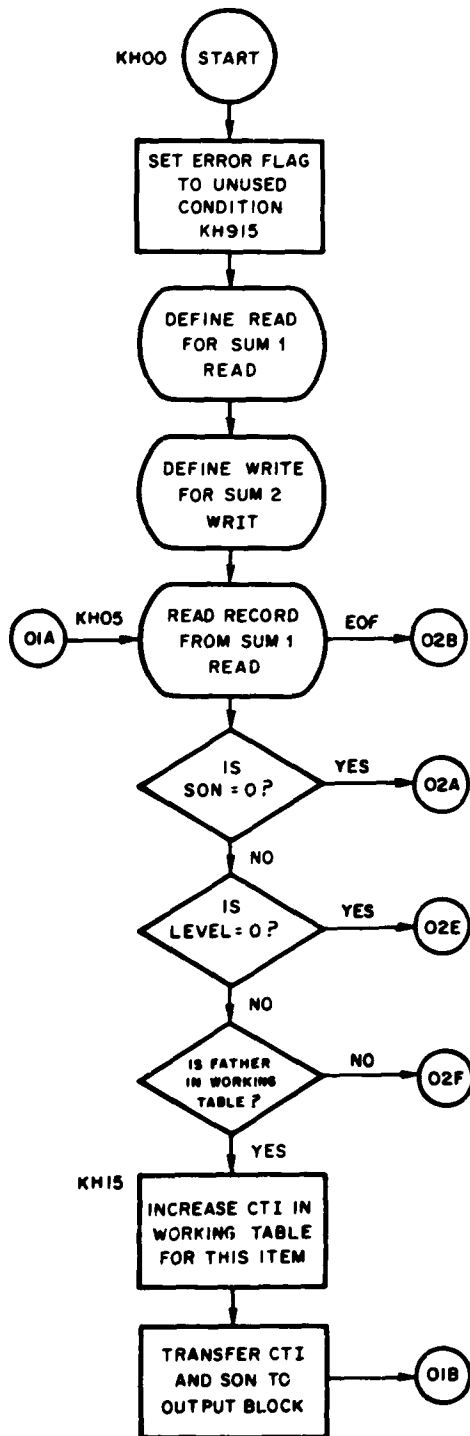
**SUBREGIONS AND SUBROUTINES USED:**

READ               SORT  
WRIT               YCOMP

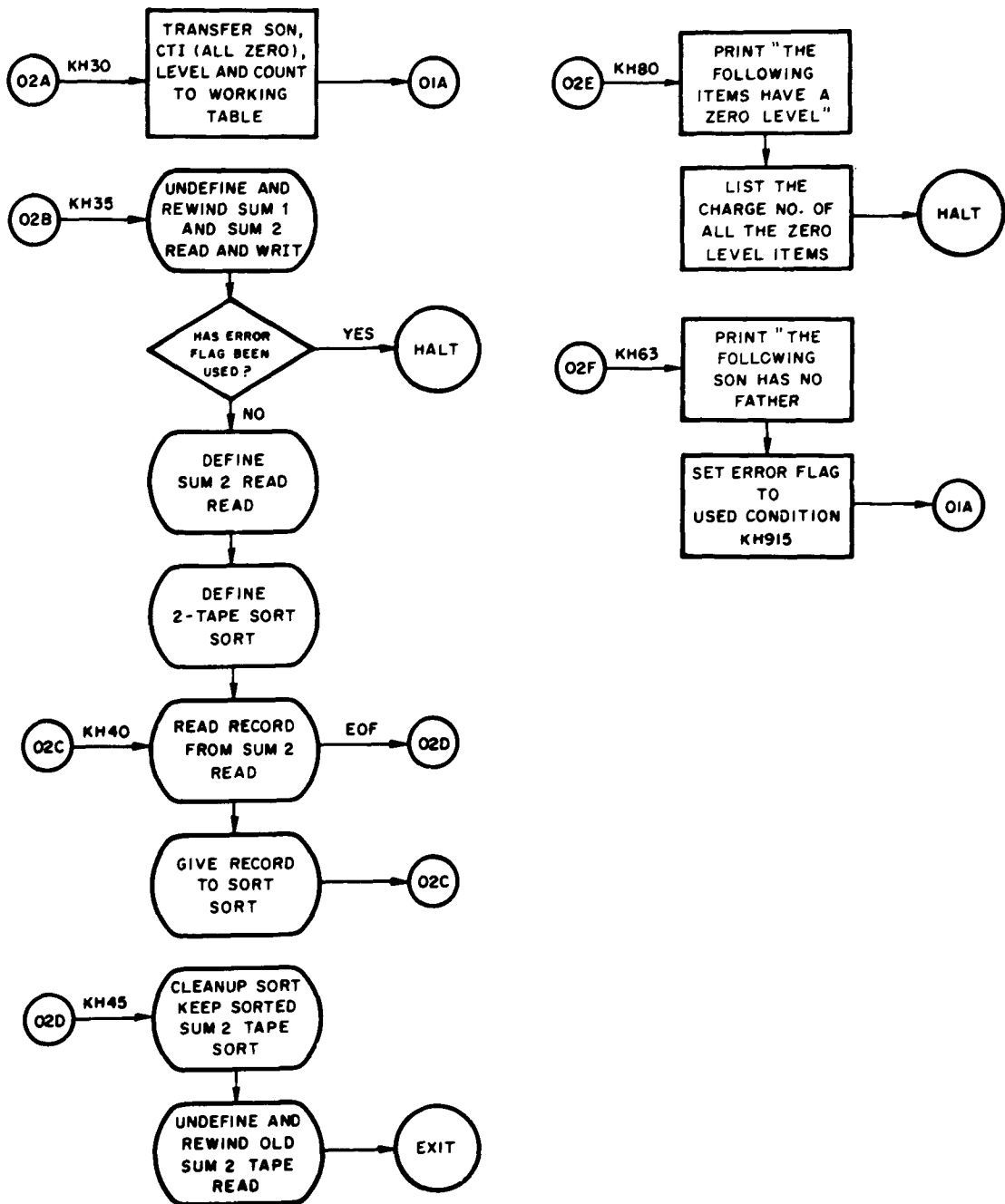
**EXPLANATION OF CALLING SEQUENCE:**

Not applicable

REGION KH00



REGION KH00



# RECORD FORMAT

PAGE \_\_\_\_\_

PROGRAM NUMBER PERT COST

NAME OF RECORD PSEUDO TIME RECORD

|             |                    |                          |                                  |                                   |                                 |                             |                          |
|-------------|--------------------|--------------------------|----------------------------------|-----------------------------------|---------------------------------|-----------------------------|--------------------------|
| DESCRIPTION | CHARACTER LOCATION | WORD 1                   | 2                                | 3                                 | 4                               | 5                           | 6                        |
|             |                    | CHARGE NUMBER            | WORK PACKAGE START EVENT         | WORK PACKAGE END EVENT            |                                 |                             |                          |
|             |                    | (16H)                    | (9H)                             |                                   |                                 |                             | (9H)                     |
| DESCRIPTION | CHARACTER LOCATION | WORD 7                   | 8                                | 9                                 | 10                              | 11                          | 12                       |
|             |                    | END EVENT (CONT.)        | WORK PACKAGE EXPECTED START DATE | WORK PACKAGE EXPECTED COMPL. DATE | WORK PACKAGE LATEST COMPL. DATE | SLACK                       | CRITICAL START EVENT     |
|             |                    |                          | D D M M Y Y                      | D D M M Y Y                       | D D M M Y Y                     | WK # 10 @ B35               | 9H                       |
| DESCRIPTION | CHARACTER LOCATION | WORD 13                  | 14                               | 15                                | 16                              | 17                          | 18                       |
|             |                    | CRIT START EVENT (CONT.) | CRITICAL END EVENT               |                                   | CRITICAL EXPECTED COMPL. DATE   | CRITICAL LATEST COMPL. DATE | SCHED/ACTUAL COMPL. DATE |
|             |                    |                          | (9H)                             |                                   | D D M M Y Y                     | D D M M Y Y                 | D D M M Y Y              |
| DESCRIPTION | CHARACTER LOCATION | WORD 19                  | 20                               | 21                                | 22                              | 23                          | 24                       |
|             |                    | SCHED/ACTUAL INDICATOR   |                                  |                                   | NETWORK DESCRIPTION             |                             |                          |
|             |                    |                          |                                  |                                   |                                 |                             |                          |
| DESCRIPTION | CHARACTER LOCATION | WORD 25                  |                                  |                                   |                                 |                             |                          |
|             |                    | NET. DESCR. (CONT.)      |                                  |                                   |                                 |                             |                          |
|             |                    |                          |                                  |                                   |                                 |                             |                          |

Fig. III-1-3 Tape Format of Working Table

PAGE ---..

| PROGRAM NUMBER | PERT COST |
|----------------|-----------|
| 1              | 1         |
| 2              | 2         |
| 3              | 3         |
| 4              | 4         |
| 5              | 5         |
| 6              | 6         |
| 7              | 7         |
| 8              | 8         |
| 9              | 9         |
| 10             | 10        |
| 11             | 11        |
| 12             | 12        |
| 13             | 13        |
| 14             | 14        |
| 15             | 15        |
| 16             | 16        |
| 17             | 17        |
| 18             | 18        |
| 19             | 19        |
| 20             | 20        |
| 21             | 21        |
| 22             | 22        |
| 23             | 23        |
| 24             | 24        |
| 25             | 25        |
| 26             | 26        |
| 27             | 27        |
| 28             | 28        |
| 29             | 29        |
| 30             | 30        |
| 31             | 31        |
| 32             | 32        |
| 33             | 33        |
| 34             | 34        |
| 35             | 35        |
| 36             | 36        |
| 37             | 37        |
| 38             | 38        |
| 39             | 39        |
| 40             | 40        |
| 41             | 41        |
| 42             | 42        |
| 43             | 43        |
| 44             | 44        |
| 45             | 45        |
| 46             | 46        |
| 47             | 47        |
| 48             | 48        |
| 49             | 49        |
| 50             | 50        |
| 51             | 51        |
| 52             | 52        |
| 53             | 53        |
| 54             | 54        |
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| 67             | 67        |
| 68             | 68        |
| 69             | 69        |
| 70             | 70        |
| 71             | 71        |
| 72             | 72        |
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| 74             | 74        |
| 75             | 75        |
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| 77             | 77        |
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| 81             | 81        |
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| 86             | 86        |
| 87             | 87        |
| 88             | 88        |
| 89             | 89        |
| 90             | 90        |
| 91             | 91        |
| 92             | 92        |
| 93             | 93        |
| 94             | 94        |
| 95             | 95        |
| 96             | 96        |
| 97             | 97        |
| 98             | 98        |
| 99             | 99        |
| 100            | 100       |

| NAME OF RECORD | SUM 2 (OUTPUT TABLE) |
|----------------|----------------------|
| 1              | 1                    |
| 2              | 2                    |
| 3              | 3                    |
| 4              | 4                    |
| 5              | 5                    |
| 6              | 6                    |
| 7              | 7                    |
| 8              | 8                    |
| 9              | 9                    |
| 10             | 10                   |
| 11             | 11                   |
| 12             | 12                   |
| 13             | 13                   |
| 14             | 14                   |
| 15             | 15                   |
| 16             | 16                   |
| 17             | 17                   |
| 18             | 18                   |
| 19             | 19                   |
| 20             | 20                   |
| 21             | 21                   |
| 22             | 22                   |
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| 37             | 37                   |
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| 41             | 41                   |
| 42             | 42                   |
| 43             | 43                   |
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| 46             | 46                   |
| 47             | 47                   |
| 48             | 48                   |
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| 66             | 66                   |
| 67             | 67                   |
| 68             | 68                   |
| 69             | 69                   |
| 70             | 70                   |
| 71             | 71                   |
| 72             | 72                   |
| 73             | 73                   |
| 74             | 74                   |
| 75             | 75                   |
| 76             | 76                   |
| 77             | 77                   |
| 78             | 78                   |
| 79             | 79                   |
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| 84             | 84                   |
| 85             | 85                   |
| 86             | 86                   |
| 87             | 87                   |
| 88             | 88                   |
| 89             | 89                   |
| 90             | 90                   |
| 91             | 91                   |
| 92             | 92                   |
| 93             | 93                   |
| 94             | 94                   |
| 95             | 95                   |
| 96             | 96                   |
| 97             | 97                   |
| 98             | 98                   |
| 99             | 99                   |
| 100            | 100                  |

Figure 1 illustrates a data structure with six rows, each consisting of a 'DESCRIPTION' and a 'CHARACTER LOCATION' track. The tracks are labeled 1 through 6 at the top. The first row shows 'CHARGE NUMBER' and 'CHRISTMAS TREE INDICATOR'. The second row shows '(IBM)'. The third row shows 'WORD'. The fourth row shows 'WORD'. The fifth row shows 'WORD'. The sixth row shows 'WORD'. The tracks are labeled 1 through 6 at the top.

**Fig. III-1-4** Tape Format of Output Table (SUM2 Tape)

Region KL00

**EXPLANATION OF REGION:**

To insert the Christmas Tree Indicator from SUM 2 tape into the corresponding record of the FILE 1 tape and create the REPORT INFO. TAPE.

**CALLING SEQUENCE:**

L       TSX       KL00, 4  
L + 1    Normal return

**INPUT:**

SUM 2 tape  
FILE 1 tape

**OUTPUT:**

REPORT INFO. TAPE

**STORAGE USED:**

Not applicable

**SUBREGIONS AND SUBROUTINES USED:**

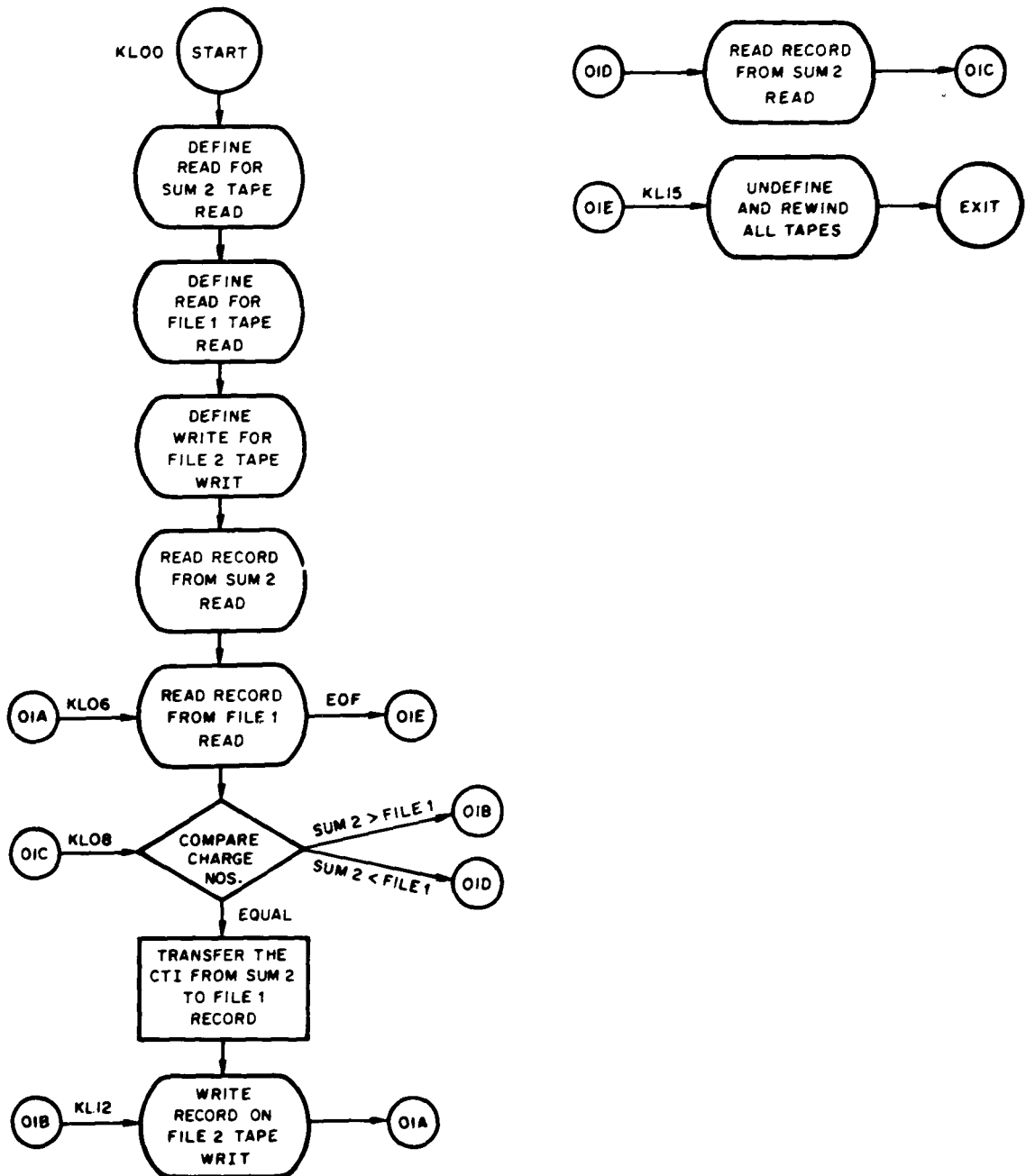
READ           YCOMP  
WRIT

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable



# REGION KLOO



# RECORD FORMAT

PROGRAM NUMBER PERT COST

NAME OF RECORD REPORT INFO RECORD

|                    |                            |                          |                            |                          |                    |    |
|--------------------|----------------------------|--------------------------|----------------------------|--------------------------|--------------------|----|
| DESCRIPTION        | WORD 1                     | 2                        | 3                          | 4                        | 5                  | 6  |
| CHARACTER LOCATION | PREDECESSOR EVENT          | SUCCESSOR EVENT          | WORK PACKAGE START DATE    | WORK PACKAGE END DATE    |                    |    |
|                    | (9H)                       | (9H)                     | D D M M Y Y                | D D M M Y Y              |                    |    |
| DESCRIPTION        | WORD 7                     | 8                        | 9                          | 10                       | 11                 | 12 |
| CHARACTER LOCATION | WORK PACKAGE LATEST DATE   | SLACK                    | CRITICAL PREDECESSOR EVENT | CRITICAL SUCCESSOR EVENT |                    |    |
|                    | D D M M Y Y                | WK x 10 @ 8 35           | (9H)                       | (9H)                     |                    |    |
| DESCRIPTION        | WORD 13                    | 14                       | 15                         | 16                       | 17                 | 18 |
| CHARACTER LOCATION | CRIT EXP COMPL DATE        | CRIT LATEST COMPL DATE   | SCHED/ACTUAL COMPL DATE    | TS/TA INDICATOR          | NETWORK DESCRIPTOR |    |
|                    | D D M M Y Y                | D D M M Y Y              | D D M M Y Y                | (1H)                     | (36H)              |    |
| DESCRIPTION        | WORD 19                    | 20                       | 21                         | 22                       | 23                 | 24 |
| CHARACTER LOCATION | NETWORK DESCRIPTOR (CONT.) |                          |                            |                          |                    |    |
|                    | CHARGE NUMBER              |                          |                            |                          |                    |    |
| DESCRIPTION        | WORD 25                    | 26                       | 27                         | 28                       | 29                 | 30 |
| CHARACTER LOCATION | CHARGE NO. (CONT.)         | CHARGE NUMBER DESCRIPTOR |                            | (36H)                    |                    |    |

Fig. III-1-5. Tape Format of Report Information Record

# RECORD FORMAT

| PROGRAM NUMBER                             |                        | PERT COST       |                          | PAGE 2 |                                 |
|--------------------------------------------|------------------------|-----------------|--------------------------|--------|---------------------------------|
| NAME OF RECORD REPORT INFO. RECORD (CONT.) |                        |                 |                          |        |                                 |
| DESCRIPTION                                | WORD 31                | 32              | 33                       | 34     | 35                              |
| CHARACTER LOCATION                         | CHG. NO. DESC. (CONT.) |                 | NEXT HIGHER RELATION     |        | RESPONSIBLE ORGN. (6H)          |
|                                            |                        |                 | (18H)                    |        |                                 |
|                                            |                        |                 |                          |        | CHARGE NO. START DATE           |
|                                            |                        |                 |                          |        | D D M M Y Y                     |
| DESCRIPTION                                | WORD 37                | 38              | 39                       | 40     | 41                              |
| CHARACTER LOCATION                         | CHARGE NO. END DATE    | CONTRACTOR CODE | NETWORK NO.              | LEVEL  | SELECTED CHG. NO. FLAG          |
|                                            |                        |                 |                          |        |                                 |
|                                            |                        |                 |                          |        | CONTRACT NO. (18H)              |
|                                            |                        |                 |                          |        |                                 |
| DESCRIPTION                                | WORD 43                | 44              | 45                       | 46     | 47                              |
| CHARACTER LOCATION                         | CONTRACT NO. (CONT.)   |                 |                          |        | NEXT HIGHER RELATION DESCRIPTOR |
|                                            |                        |                 |                          |        |                                 |
|                                            |                        |                 |                          |        |                                 |
| DESCRIPTION                                | WORD 49                | 50              | 51                       | 52     | 53                              |
| CHARACTER LOCATION                         | N.M.R. DESC. (CONT.)   |                 | CHRISTMAS TREE INDICATOR |        | PERFORMING ORGN. (6H)           |
|                                            |                        |                 |                          |        |                                 |
|                                            |                        |                 |                          |        |                                 |
| DESCRIPTION                                | WORD 55                | 56              | 57                       | 58     | 59                              |
| CHARACTER LOCATION                         | RAINBOW CATEGORY       |                 |                          |        | COST CATEGORY (18H)             |
|                                            |                        |                 |                          |        |                                 |
|                                            |                        |                 |                          |        |                                 |

Fig. III-I-5. Tape Format of Report Information Record (Continued)

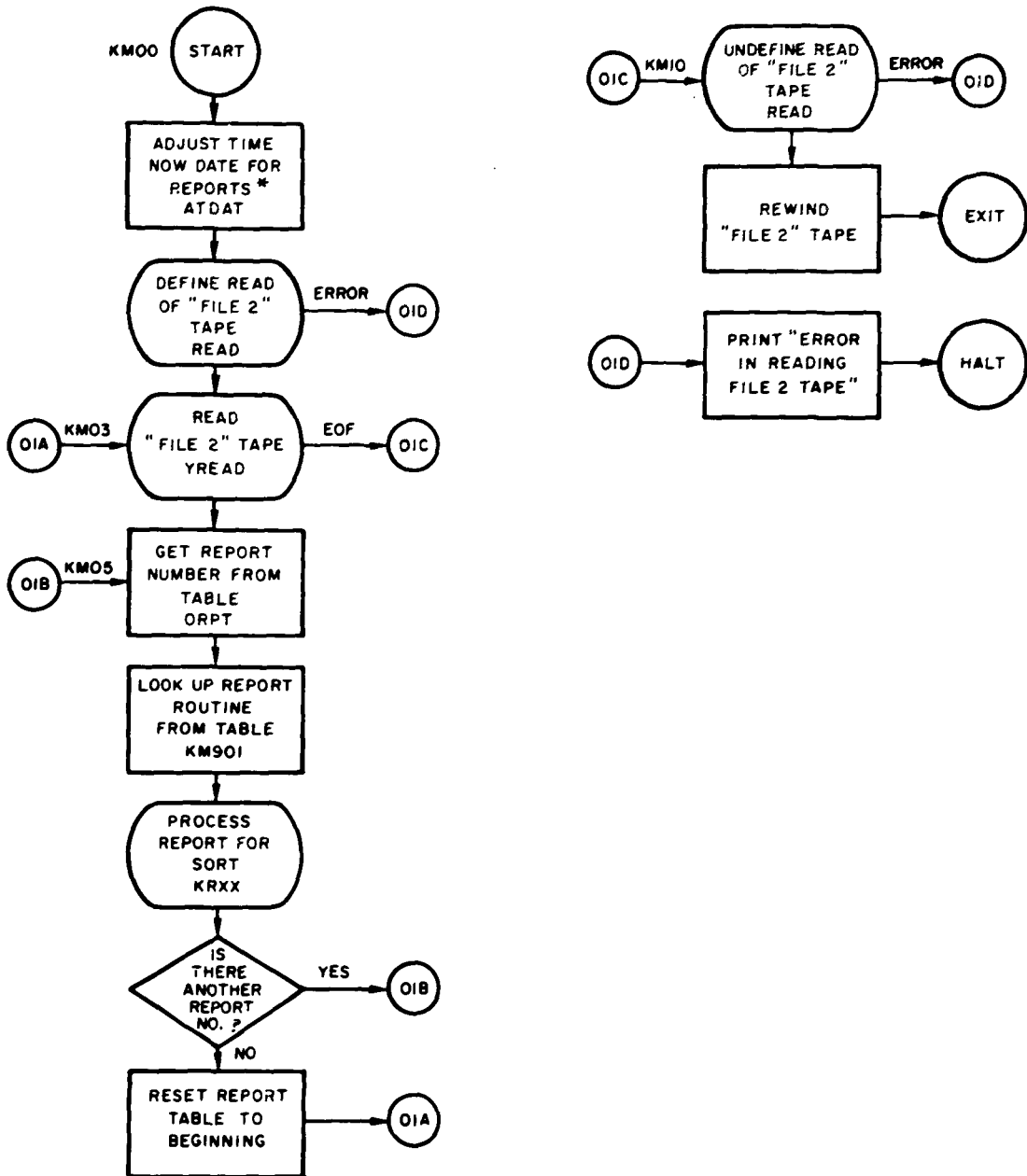
# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 3

NAME OF RECORD REPORT INFO. RECORD (CONT.)

| WORD 61            |  | WORD 62       |          | WORD 63 |      | WORD 64 |      | WORD 65 |      | WORD 66 |      |
|--------------------|--|---------------|----------|---------|------|---------|------|---------|------|---------|------|
| COST CAT. (CONT.)  |  | RESOURCE CODE | H/U IND. | ACT     | BUD  | EST     | ACT  | BUD     | EST  | ACT     | BUD  |
|                    |  | (4H)          | (2H)     | (1H)    | (1H) | (1H)    | (1H) | (1H)    | (1H) | (1H)    | (1H) |
| DESCRIPTION        |  |               |          |         |      |         |      |         |      |         |      |
| CHARACTER LOCATION |  |               |          |         |      |         |      |         |      |         |      |
| DESCRIPTION        |  |               |          |         |      |         |      |         |      |         |      |
| CHARACTER LOCATION |  |               |          |         |      |         |      |         |      |         |      |
| DESCRIPTION        |  |               |          |         |      |         |      |         |      |         |      |
| CHARACTER LOCATION |  |               |          |         |      |         |      |         |      |         |      |
| DESCRIPTION        |  |               |          |         |      |         |      |         |      |         |      |
| CHARACTER LOCATION |  |               |          |         |      |         |      |         |      |         |      |
| DESCRIPTION        |  |               |          |         |      |         |      |         |      |         |      |
| CHARACTER LOCATION |  |               |          |         |      |         |      |         |      |         |      |
| DESCRIPTION        |  |               |          |         |      |         |      |         |      |         |      |
| CHARACTER LOCATION |  |               |          |         |      |         |      |         |      |         |      |

Fig. III-I-5. Tape Format of Report Information Record (Continued)



\* IF TIME NOW "DAY"  $\leq 10$ , ADJUST TO PREVIOUS MONTH  
IF TIME NOW "DAY"  $> 10$ , USE PRESENT MONTH

Region KM00

EXPLANATION OF REGION:

To set up initial sort for Cost Reports.

CALLING SEQUENCE:

L TSX KM00, 4

L+1 Normal return

INPUT:

REPORT INFORMATION TAPE containing PERT Cost data records.

OUTPUT:

Reporting tape with Report breakdown.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

YREAD

KRxx - Report routines

READ

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

Region KN00

EXPLANATION OF REGION:

To total the cost information for actuals, budgets, and estimates, by hours, direct dollars, and total dollars, and to calculate the overrun/underrun.

CALLING SEQUENCE:

L TSX KN00, 4

L+1 Normal return

INPUT:

XR1 = Location of start of data record (complemented).

Z+10 thru Z+21 cleared to zero.

OUTPUT:

Z+10 = act. hrs to date                      Z+16 = latest rev. est. (dir. \$)

Z+11 = contract est. (hrs)                      Z+17 = (over) underrun (dir. \$)

Z+12 = latest rev. est. (hrs)                      Z+18 = act. total \$ to date

Z+13 = (overrun) underrun (hrs)                      Z+19 = contract est. (total \$)

Z+14 = act. dir. \$ to date                      Z+20 = latest rev. est (total \$)

Z+15 = contract est. (dir. \$)                      Z+21 = (over) underrun (total \$)

STORAGE USED:

Z+10 thru Z+21

Z, Z+1

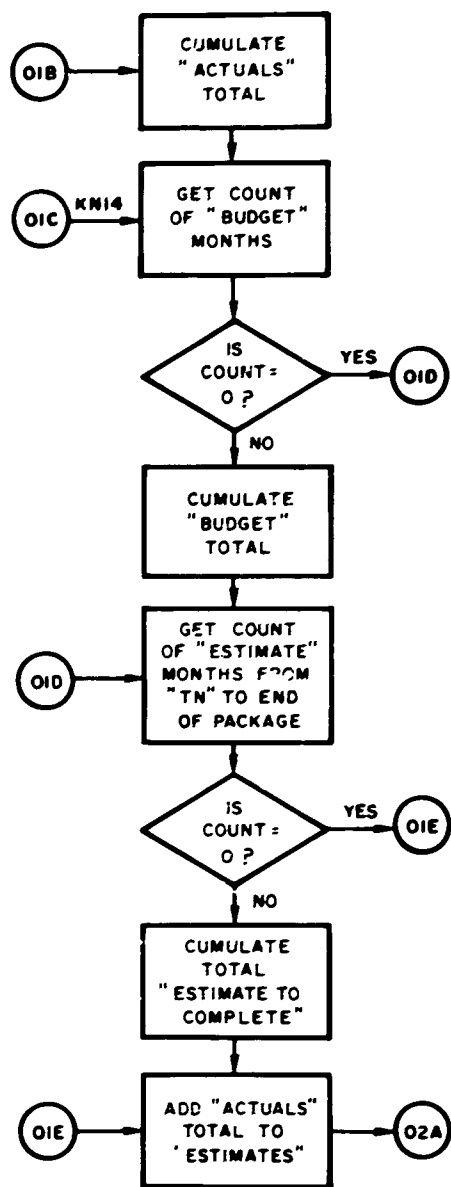
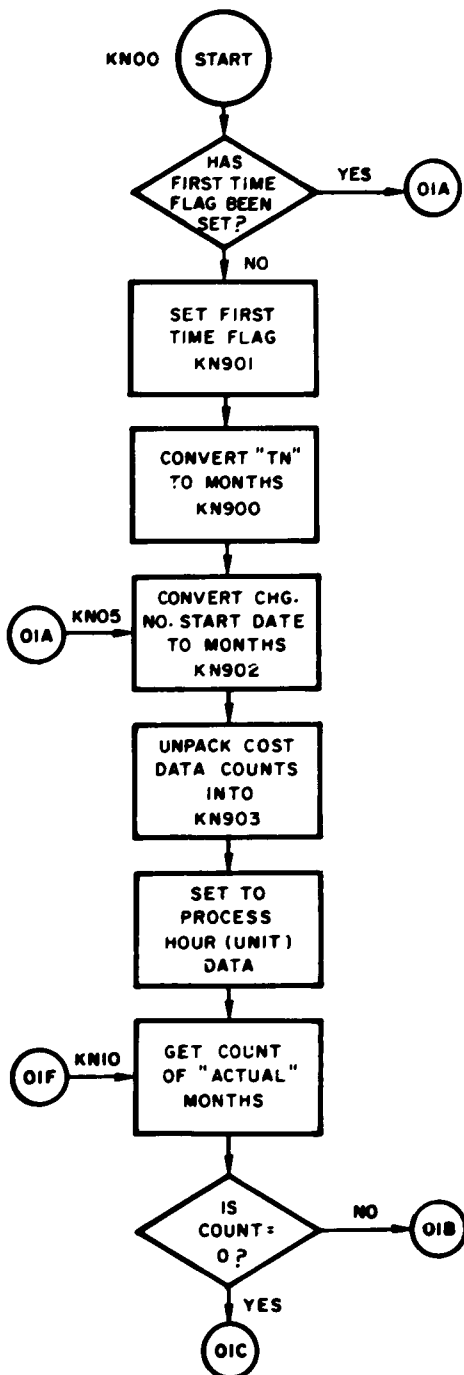
SUBREGIONS AND SUBROUTINES USED:

FIXPT

UPCK

EXPLANATION OF CALLING SEQUENCE:

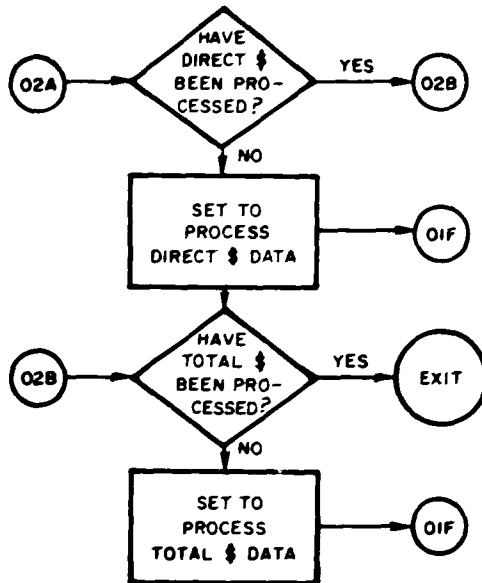
Not applicable.





REGION KNOO

---



Region KN50

EXPLANATION OF REGION:

To adjust dollar amounts to nearest thousands.

CALLING SEQUENCE:

L     TSX   KN50, 4

L+1   Normal return

INPUT:

Dollar amounts in Z storage block.

OUTPUT:

Adjusted dollar amounts in Z storage block.

STORAGE USED:

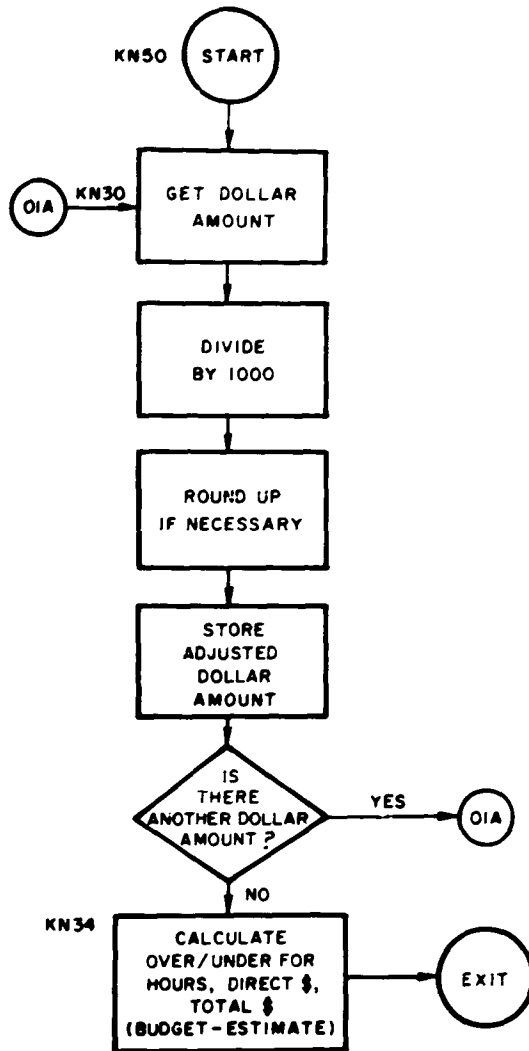
Z+14 thru Z+21.

SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.



Region KN100

EXPLANATION OF REGION:

To compute planned work to date for hours, direct dollars, and total dollars.

CALLING SEQUENCE:

L     TSX   KN100, 4

L+1   Normal return

INPUT:

XR1 = location of PERT Cost data record (complemented).

OUTPUT:

KN909     =   Planned hours to date

KN909+1   =   Planned direct dollars to date

KN909+2   =   Planned total dollars to date

STORAGE USED:

Not applicable.

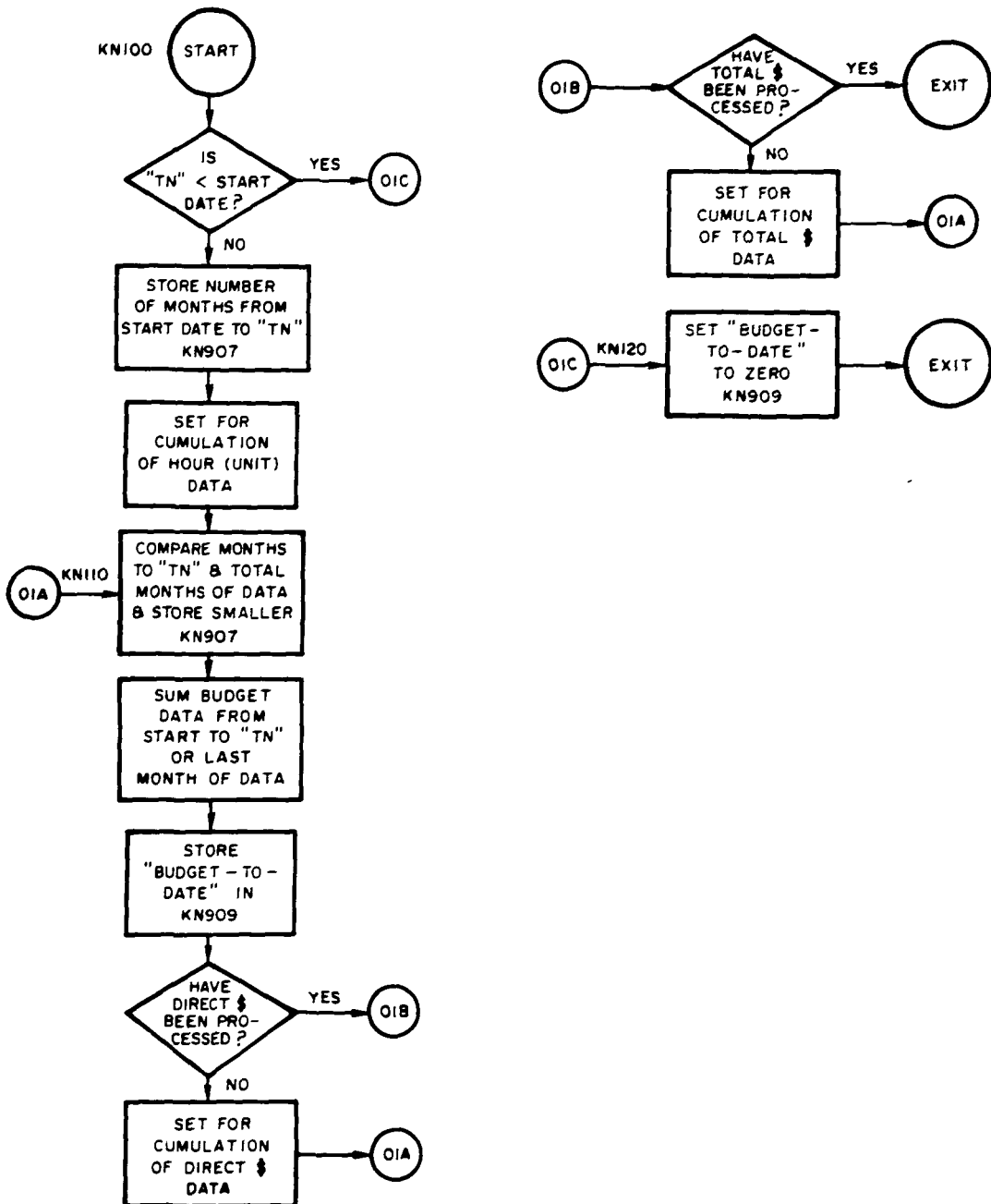
SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION KN100



Region KP00

EXPLANATION OF REGION:

To format "Organization Status Report" data and give to sort routine.

CALLING SEQUENCE:

L TSX KP00, 4

L+1 PZE N

L+2 Normal return

INPUT:

PERT Cost data record.

OUTPUT:

"Organization Status Report" data records.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

XSORT

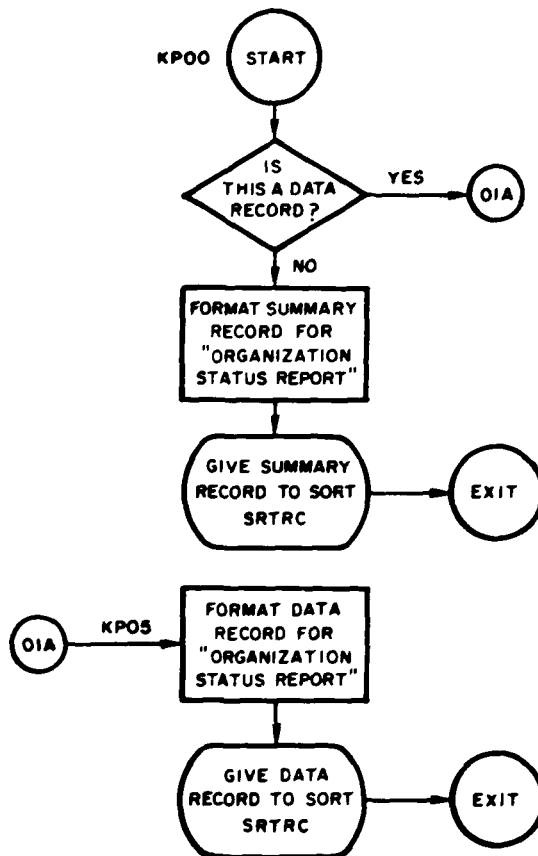
EXPLANATION OF CALLING SEQUENCE:

N: 0 = summary record to be formatted

1 = data record to be formatted

REGION KPOO

---



Region KP10

EXPLANATION OF REGION:

To determine acceptability of data record for Reports 10 and 20.

CALLING SEQUENCE:

L TSX KP10, 4

L+1 Normal return

INPUT:

PERT Cost data record.

OUTPUT:

Reports 10 and 20 data records.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

YLVL KP00 (see Subsec. 3.8.5.14)

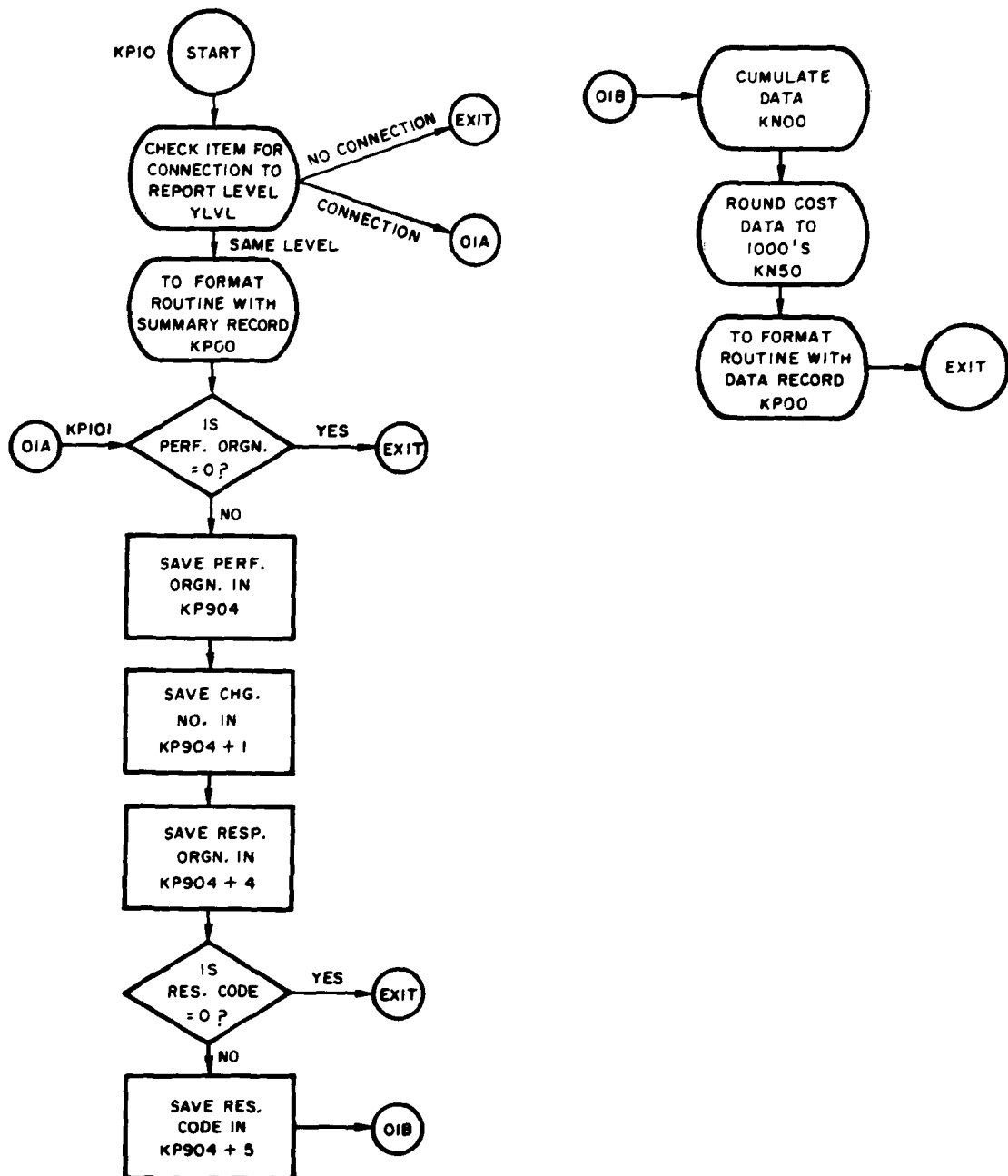
KN00 (see Subsec. 3.8.5.11) KN50 (see Subsec. 3.8.5.12)

EXPLANATION OF CALLING SEQUENCE:

Not applicable.



REGION-KPIO



Region KP11

EXPLANATION OF REGION:

To determine acceptability of data record for Reports 11 and 21.

CALLING SEQUENCE:

L TSX KP11, 4

L+1 Normal return

INPUT:

PERT Cost data record.

OUTPUT:

Reports 11 and 21 data records.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

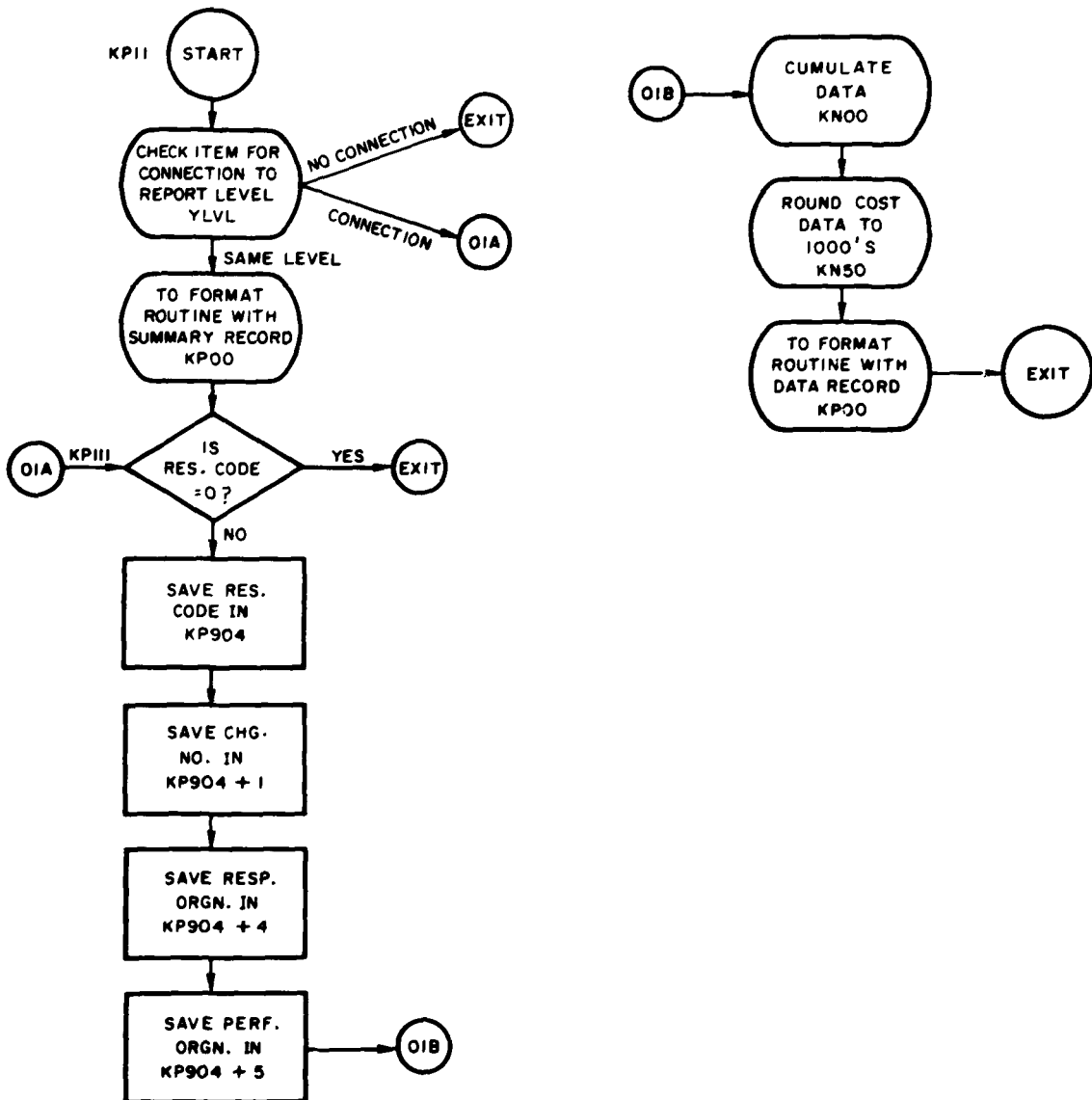
YLVL KP00

KN00 KN50

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION KP11



Region KP12

EXPLANATION OF REGION:

To determine acceptability of data record for Reports 12 and 22.

CALLING SEQUENCE:

L TSX KP12, 4

L+1 Normal return

INPUT:

PERT Cost data record.

OUTPUT:

Reports 12 and 22 data records.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

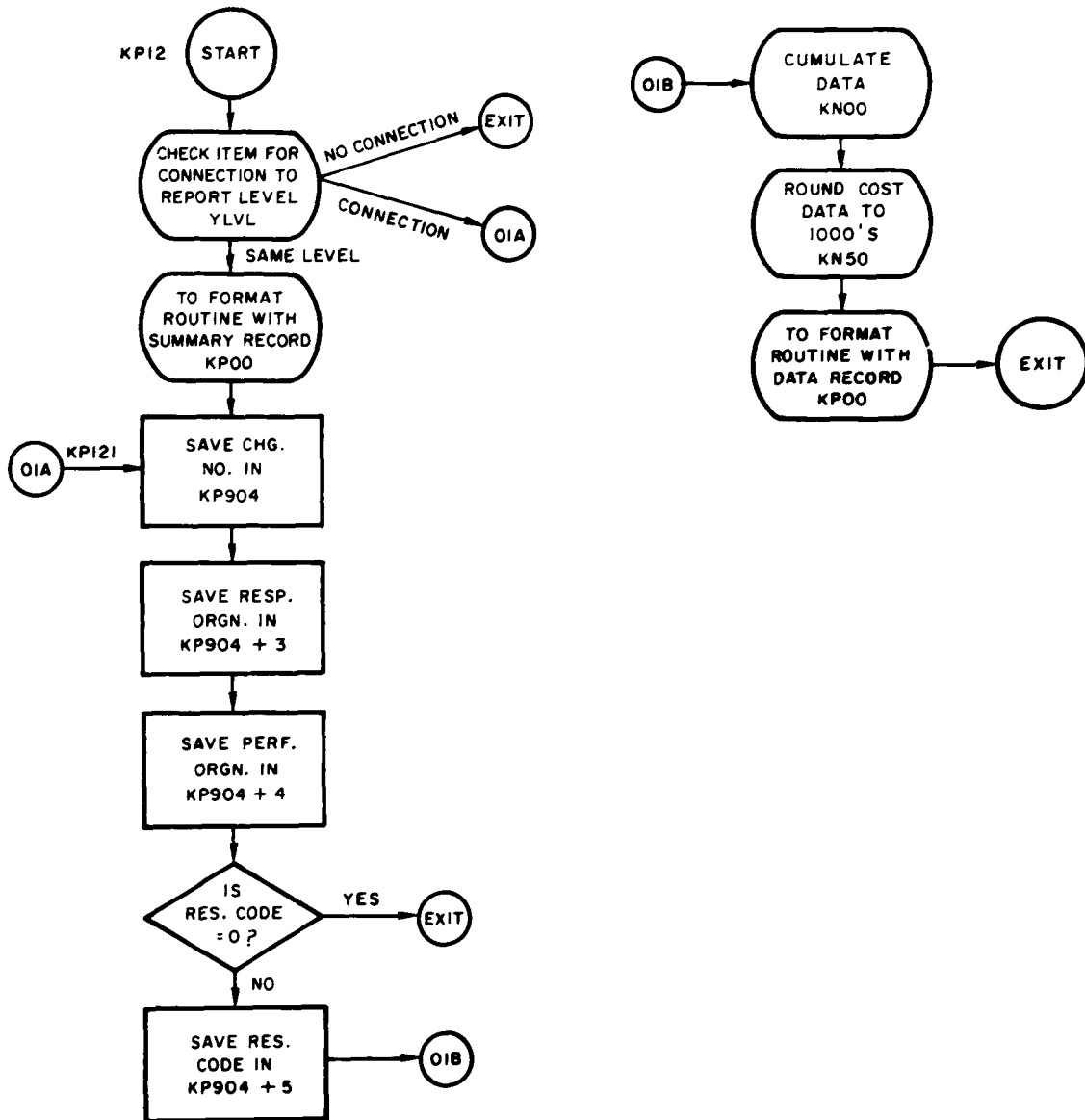
YLV L KP00

KN00 KN50

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION KPI2



Region KP13

**EXPLANATION OF REGION:**

To determine acceptability of data record for Reports 13 and 23.

**CALLING SEQUENCE:**

L TSX KP13, 4

L+1 Normal return

**INPUT:**

PERT Cost data record.

**OUTPUT:**

Reports 13 and 23 data records.

**STORAGE USED:**

Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

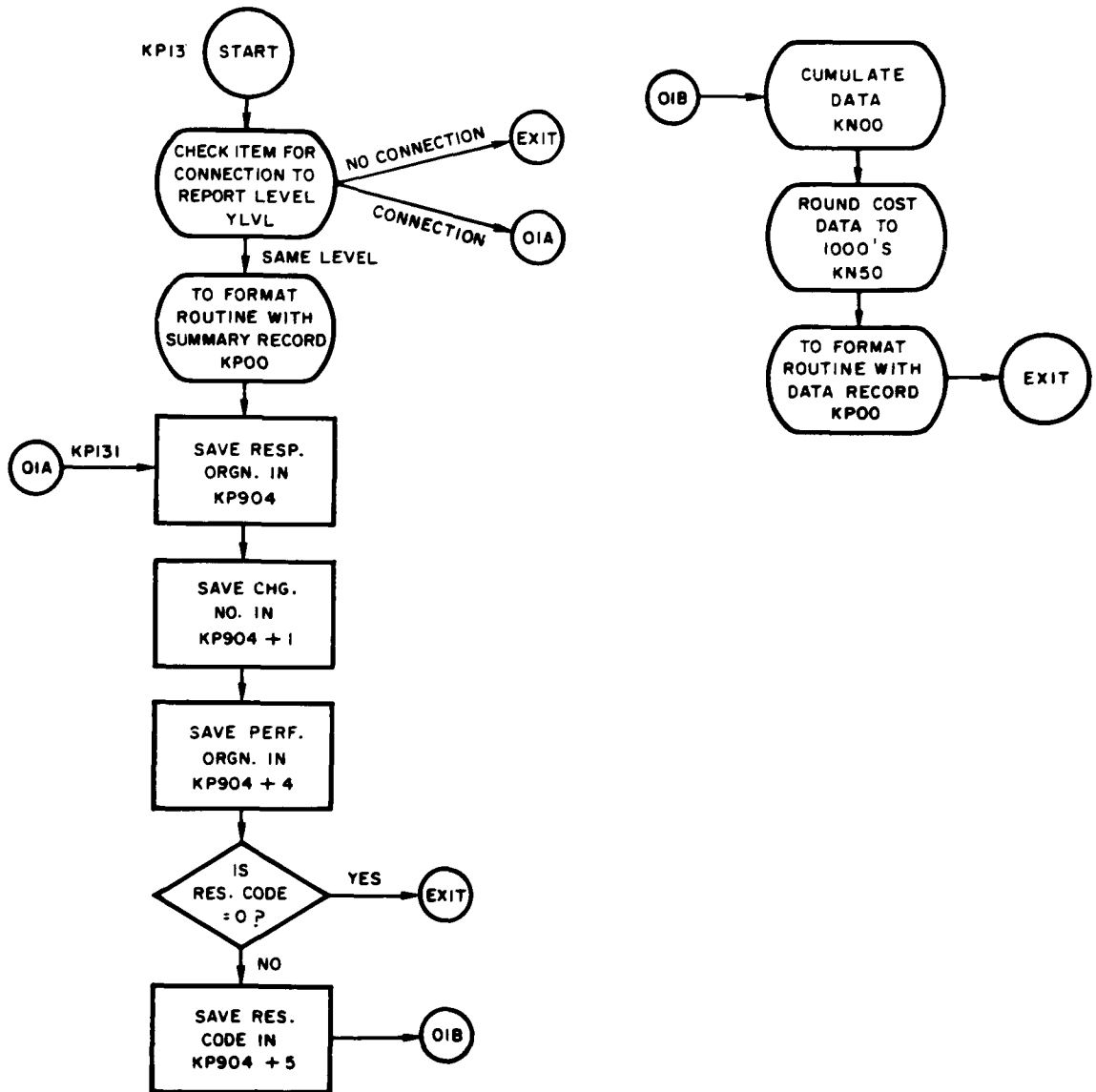
YLVL KP00

KN00 KN50

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.

# REGION KP13



Region KR10

**EXPLANATION OF REGION:**

To select and set up sequence for sorting "Organization Status Report" by performing organization, charge number, responsible organization, resource code. (Report 10)

**CALLING SEQUENCE:**

L     TSX   KR10, 4  
L+1   Normal return

**INPUT:**

Accumulator: Report level, , Report no.  
YCNT: Location of PERT Cost data record.

**OUTPUT:**

Data record for Report 10.

**STORAGE USED:**

Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

KP10 (see Subsec. 3.8.5.15)

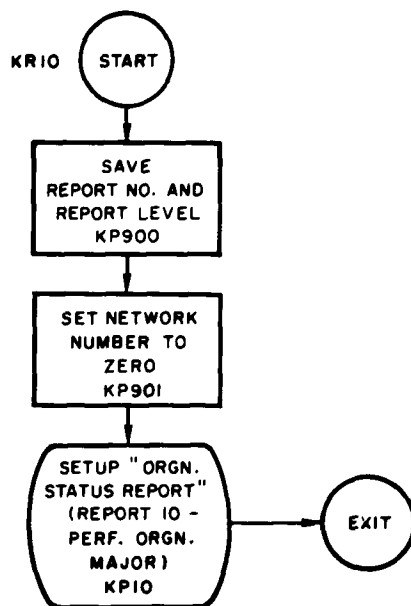
**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.



REGION KRIO

---



# RECORD FORMAT

PROGRAM NUMBER \_\_\_\_\_ PERT COST \_\_\_\_\_ PAGE \_\_\_\_\_

NAME OF RECORD \_\_\_\_\_ REPORT 10 (SUMMARY) \_\_\_\_\_

|                    | 1          | 2                                | 3                      | 4                        | 5              | 6 |
|--------------------|------------|----------------------------------|------------------------|--------------------------|----------------|---|
| DESCRIPTION        | REPORT NO. | REPORT LEVEL                     | REPORT LEVEL INDICATOR | SUMMARY FLAG             | NETWORK NUMBER |   |
| CHARACTER LOCATION | 0B17       | 0035                             | (18H)                  | 0 0035                   | (6H)           |   |
| DESCRIPTION        | WORD 7     | CHARGE NUMBER                    | CHARGE NUMBER          | CHARGE NUMBER DESCRIPTOR |                |   |
| CHARACTER LOCATION |            | (18H)                            |                        | (36H)                    |                |   |
| DESCRIPTION        | WORD 13    | CHARGE NUMBER DESCRIPTOR (CONT.) | LEVEL CODE             |                          |                |   |
| CHARACTER LOCATION |            |                                  | 0035                   |                          |                |   |
| DESCRIPTION        | WORD       |                                  |                        |                          |                |   |
| CHARACTER LOCATION |            |                                  |                        |                          |                |   |
| DESCRIPTION        | WORD       |                                  |                        |                          |                |   |
| CHARACTER LOCATION |            |                                  |                        |                          |                |   |

Fig III-I-6. Tape Format of Report 10, Summary

# RECORD FORMAT

|                    |                          |                    |                        |               |              |   |  |
|--------------------|--------------------------|--------------------|------------------------|---------------|--------------|---|--|
| PROGRAM NUMBER     |                          | PERT COST          |                        | PAGE          |              | 1 |  |
| NAME OF RECORD     |                          | REPORT ID (DATA)   |                        |               |              |   |  |
| DESCRIPTION        | REPORT NO.               | REPORT LEVEL       | REPORT LEVEL INDICATOR | SUMMARY FLAG  | VACANT FIELD |   |  |
| CHARACTER LOCATION | 0017                     | 0035               | (10H)                  | 10035         | 00035        | 6 |  |
| DESCRIPTION        | PERFORMING ORGN.         | CHARGE NUMBER      | RESPONSIBLE ORGN.      | RESOURCE CODE |              |   |  |
| CHARACTER LOCATION | (6H)                     | (10H)              | (6H)                   | (4H)          |              |   |  |
| DESCRIPTION        | CHARGE NUMBER            | RESPONSIBLE ORGN.  | PERFORMING ORGN.       | RESOURCE CODE |              |   |  |
| CHARACTER LOCATION | (10H)                    | (6H)               | (6H)                   | (4H)          | 18           |   |  |
| DESCRIPTION        | CHARGE NUMBER DESCRIPTOR |                    |                        |               |              |   |  |
| CHARACTER LOCATION | (36H)                    |                    |                        |               |              |   |  |
| DESCRIPTION        | NETWORK NUMBER           | NETWORK DESCRIPTOR |                        |               |              |   |  |
| CHARACTER LOCATION | (6H)                     | (36H)              |                        |               |              |   |  |

Fig. III-I-7. Tape Format of Report 10, Data

# RECORD FORMAT

PROGRAM NUMBER \_\_\_\_\_ PERT COST \_\_\_\_\_ PAGE 2

NAME OF RECORD \_\_\_\_\_ REPORT 10 (DATA (CONT))

|                    |                            |                 |                             |                        |                       |                         |
|--------------------|----------------------------|-----------------|-----------------------------|------------------------|-----------------------|-------------------------|
| DESCRIPTION        | WORD 31                    | 32              | 33                          | 34                     | 35                    | 36                      |
| CHARACTER LOCATION | NETWORK<br>DESCR<br>(CONT) | CONTRACTOR      | SCHED/ACTUAL<br>COMPL. DATA | $T_s/T_a$<br>INDICATOR | SLACK                 | ACTUAL HOURS<br>TO DATA |
|                    |                            | (4H)            | D D M M Y Y (UH)            |                        | WK x 10 @ B35         | @ B35                   |
| DESCRIPTION        | WORD 37                    | 38              | 39                          | 40                     | 41                    | 42                      |
| CHARACTER LOCATION | ESTIMATE<br>HOURS          | BUDGET<br>HOURS | OVER/UNDER<br>HOURS         | ACTUAL<br>DIRECT \$    | ESTIMATE<br>DIRECT \$ | BUDGET<br>DIRECT \$     |
|                    | @ B 35                     | @ B35           | @ B35                       | @ B35                  | @ B35                 | @ B35                   |
| DESCRIPTION        | WORD 43                    |                 |                             |                        |                       |                         |
| CHARACTER LOCATION | OVER/UNDER<br>DIRECT \$    |                 |                             |                        |                       |                         |
|                    | @ B35                      |                 |                             |                        |                       |                         |
| DESCRIPTION        | WORD                       |                 |                             |                        |                       |                         |
| CHARACTER LOCATION |                            |                 |                             |                        |                       |                         |
| DESCRIPTION        | WORD                       |                 |                             |                        |                       |                         |
| CHARACTER LOCATION |                            |                 |                             |                        |                       |                         |

Fig. III-I-7. Tape Format of Report 10, Data (Continued)

Region KR11

EXPLANATION OF REGION:

To select and set up sequence for sorting "Organization Status Report" by resource code, charge number, responsible organization, performing organization (Report 11).

CALLING SEQUENCE:

L     TSX   KR11, 4  
L+1   Normal return

INPUT:

Accumulator: Report level,, Report number.  
YCNT: Location of PERT Cost data record.

OUTPUT:

Report 11 data record.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

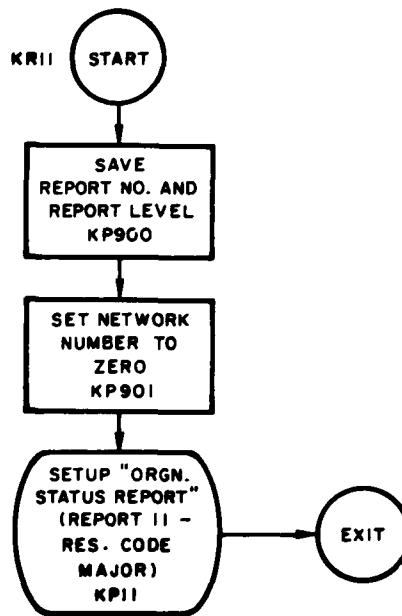
KP11

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION KR11

---



# RECORD FORMAT

| PROGRAM NUMBER     |         | PERT COST                                          |         | PAGE                   |         |
|--------------------|---------|----------------------------------------------------|---------|------------------------|---------|
| NAME OF RECORD     |         | REPORT 11 (DATA)                                   |         |                        |         |
| DESCRIPTION        | WORD 1  | REPORT NO.                                         | WORD 2  | REPORT LEVEL INDICATOR | WORD 3  |
| CHARACTER LOCATION | WORD 4  | REPORT LEVEL                                       | WORD 5  | SUMMARY FLAG           | WORD 6  |
|                    | WORD 7  | 0 B 17                                             | WORD 8  | 0 B 35                 | WORD 9  |
| DESCRIPTION        | WORD 10 | CHARGE NUMBER                                      | WORD 11 | RESPONSIBLE ORGN.      | WORD 12 |
| CHARACTER LOCATION | WORD 13 | PERFORMING ORGN.                                   | WORD 14 | (6H)                   | WORD 15 |
|                    | WORD 16 | FOR WORDS 13 THRU 43 - SEE REPORT 10 (DATA) FORMAT | WORD 17 |                        | WORD 18 |
| DESCRIPTION        | WORD 19 |                                                    | WORD 20 |                        | WORD 21 |
| CHARACTER LOCATION | WORD 22 |                                                    | WORD 23 |                        | WORD 24 |
| DESCRIPTION        | WORD 25 |                                                    | WORD 26 |                        | WORD 27 |
| CHARACTER LOCATION | WORD 28 |                                                    | WORD 29 |                        | WORD 30 |
| DESCRIPTION        | WORD 31 |                                                    | WORD 32 |                        | WORD 33 |
| CHARACTER LOCATION | WORD 34 |                                                    | WORD 35 |                        | WORD 36 |
| DESCRIPTION        | WORD 37 |                                                    | WORD 38 |                        | WORD 39 |
| CHARACTER LOCATION | WORD 40 |                                                    | WORD 41 |                        | WORD 42 |
|                    | WORD 43 |                                                    | WORD 44 |                        | WORD 45 |

Fig. III-I-8. Tape Format of Report 11, Data

Region KR12

EXPLANATION OF REGION:

To select and set up sequence for sorting "Organization Status Report" by charge number, responsible organization, performing organization, resource code (Report 12).

CALLING SEQUENCE:

L     TSX   KR12, 4  
L+1   Normal return

INPUT:

Accumulator: Report level,, Report number.  
YCNT: Location of PERT Cost data record.

OUTPUT:

Report 12 data record.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

KP12

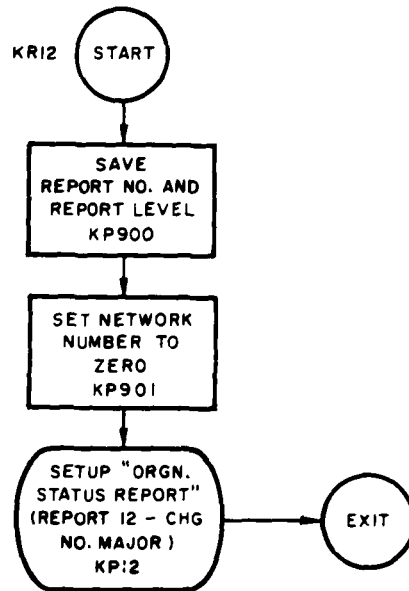
EXPLANATION OF CALLING SEQUENCE:

Not applicable.



REGION KR12

---



# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE       

NAME OF RECORD REPORT 12 (DATA)

| DESCRIPTION        | WORD 1        | WORD 2                                             | WORD 3                 | WORD 4           | WORD 5        | WORD 6  |
|--------------------|---------------|----------------------------------------------------|------------------------|------------------|---------------|---------|
| CHARACTER LOCATION | REPORT NO.    | REPORT LEVEL                                       | REPORT LEVEL INDICATOR | SUMMARY FLAG     | VACANT FIELD  |         |
|                    | 0 B17         | 0 B35                                              | (18H)                  | 1 0 B35          | 0 0 B35       |         |
| DESCRIPTION        | WORD 7        | WORD 8                                             | WORD 9                 | WORD 10          | WORD 11       | WORD 12 |
| CHARACTER LOCATION | CHARGE NUMBER |                                                    | RESPONSIBLE ORGN.      | PERFORMING ORGN. | RESOURCE CODE |         |
|                    | (18H)         |                                                    | (6H)                   | (6H)             | (4H)          |         |
| DESCRIPTION        | WORD 13       | FOR WORDS 13 THRU 43 - SEE REPORT 10 (DATA) FORMAT |                        |                  |               |         |
| CHARACTER LOCATION |               |                                                    |                        |                  |               |         |
| DESCRIPTION        | WORD          |                                                    |                        |                  |               |         |
| CHARACTER LOCATION |               |                                                    |                        |                  |               |         |
| DESCRIPTION        | WORD          |                                                    |                        |                  |               |         |
| CHARACTER LOCATION |               |                                                    |                        |                  |               |         |

Fig III-I-9. Tape Format of Report 12, Data

### Region KR13

#### EXPLANATION OF REGION:

To select and set up sequence for sorting "Organization Status Report" by responsible organization, charge number, performing organization, resource code (Report 13).

#### CALLING SEQUENCE:

L     TSX    KR13, 4

L+1   Normal return

#### INPUT:

Accumulator: Report level, , Report number.

YCNT: Location of PERT Cost data record.

#### OUTPUT:

Report 13 data record.

#### STORAGE USED:

Not applicable.

#### SUBREGIONS AND SUBROUTINES USED:

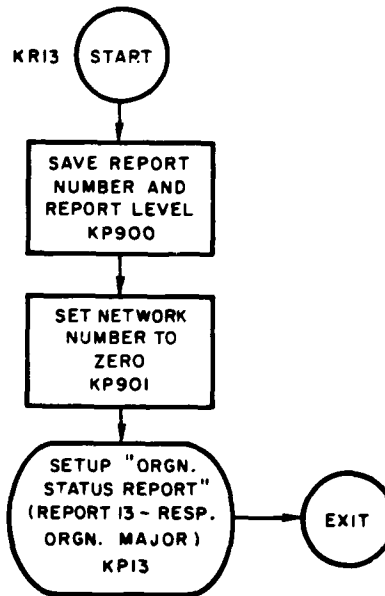
KP13

#### EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION KR13

---



# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 13 (DATA)

| WORD               | 1          | 2            | 3                      | 4            | 5            | 6 |
|--------------------|------------|--------------|------------------------|--------------|--------------|---|
| DESCRIPTION        | REPORT NO. | REPORT LEVEL | REPORT LEVEL INDICATOR | SUMMARY FLAG | VACANT FIELD |   |
| CHARACTER LOCATION | 0917       | 0935         | (18H)                  | 10835        | 00835        |   |

| WORD               | 7                 | 8             | 9                | 10            | 11 | 12 |
|--------------------|-------------------|---------------|------------------|---------------|----|----|
| DESCRIPTION        | RESPONSIBLE ORGN. | CHARGE NUMBER | PERFORMING ORGN. | RESOURCE CODE |    |    |
| CHARACTER LOCATION | (6H)              | (18H)         | (6H)             | 4H            |    |    |

FOR WORDS 13 THRU 43-SEE REPORT 10 (DATA) FORMAT

| WORD               | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 |
|--------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| DESCRIPTION        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| CHARACTER LOCATION |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| DESCRIPTION        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| CHARACTER LOCATION |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| DESCRIPTION        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| CHARACTER LOCATION |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

Fig III-I-10. Tape Format of Report 13, Data

Region KR20

EXPLANATION OF REGION:

To select and set up sequence for sorting "Organization Status Report" by network number, performing organization, charge number, responsible organization, resource code (Report 20).

CALLING SEQUENCE:

L     TSX   KR20, 4

L+1   Normal return

INPUT:

Accumulator: Report level, , Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 20 data record.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

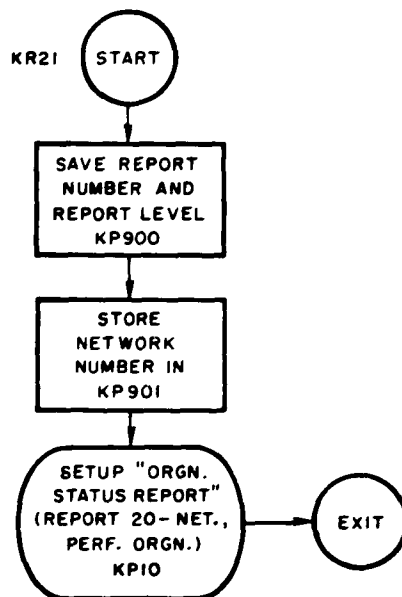
KP10

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION KR20

---



# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 20 (DATA)

| WORD               | 1          | 2            | 3                      | 4            | 5           | 6 |
|--------------------|------------|--------------|------------------------|--------------|-------------|---|
| DESCRIPTION        | REPORT NO. | REPORT LEVEL | REPORT LEVEL INDICATOR | SUMMARY FLAG | NETWORK NO. |   |
| CHARACTER LOCATION | 0817       | 0835         | (10H)                  | 10835        | (5H)        |   |

| WORD               | 7               | 8             | 9                 | 10            | 11 | 12 |
|--------------------|-----------------|---------------|-------------------|---------------|----|----|
| DESCRIPTION        | PERFORMING ORGN | CHARGE NUMBER | RESPONSIBLE ORGN. | RESOURCE CODE |    |    |
| CHARACTER LOCATION | (5H)            | (10H)         | (5H)              | (4H)          |    |    |

| WORD               | 13                                               | 43 |
|--------------------|--------------------------------------------------|----|
| DESCRIPTION        | FOR WORDS 13 THRU 43-SEE REPORT 10 (DATA) FORMAT |    |
| CHARACTER LOCATION |                                                  |    |

| WORD               |  |
|--------------------|--|
| DESCRIPTION        |  |
| CHARACTER LOCATION |  |

| WORD               |  |
|--------------------|--|
| DESCRIPTION        |  |
| CHARACTER LOCATION |  |

Fig. III-I-11. Tape Format of Report 20, Data



Region KR21

EXPLANATION OF REGION:

To select and set up sequence for sorting "Organization Status Report" by network number, resource code, charge number, responsible organization, performing organization (Report 21).

CALLING SEQUENCE:

L     TSX    KR21, 4

L+1   Normal return

INPUT:

Accumulator: Report level, , Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 21 data record.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

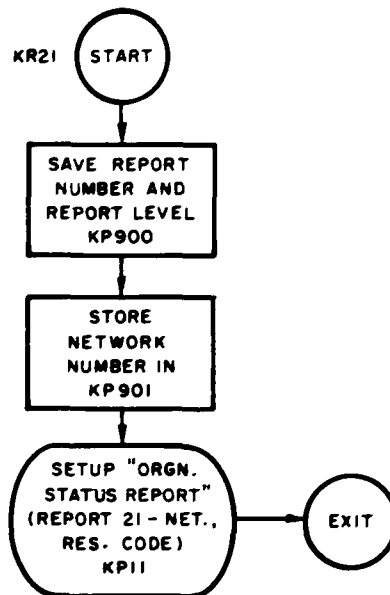
KP11

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION KR21

---



# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 21 (DATA)

| WORD               | 1          | 2            | 3                      | 4 | 5            | 6           |
|--------------------|------------|--------------|------------------------|---|--------------|-------------|
| DESCRIPTION        | REPORT NO. | REPORT LEVEL | REPORT LEVEL INDICATOR |   | SUMMARY FLAG | NETWORK NO. |
| CHARACTER LOCATION | 0817       | 0835         | (18H)                  |   | 10835        | (6H)        |

| WORD               | 7             | 8 | 9             | 10 | 11                | 12               |
|--------------------|---------------|---|---------------|----|-------------------|------------------|
| DESCRIPTION        | RESOURCE CODE |   | CHARGE NUMBER |    | RESPONSIBLE ORGN. | PERFORMING ORGN. |
| CHARACTER LOCATION | (4H)          |   | (18H)         |    | (6H)              | (6H)             |

FOR WORDS 13 THRU 43-SEE REPORT 10 (DATA) FORMAT

| WORD               | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 |
|--------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| DESCRIPTION        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| CHARACTER LOCATION |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| DESCRIPTION        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| CHARACTER LOCATION |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| DESCRIPTION        |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| CHARACTER LOCATION |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

Fig. III-I-12. Tape Format of Report 21, Data

Region KR22

EXPLANATION OF REGION:

To select and set up sequence for sorting "Organization Status Report" by network number, charge number, responsible organization, performing organization, resource code (Report 22).

CALLING SEQUENCE:

L TSX KR22, 4

L+1 Normal return

INPUT:

Accumulator: Report level,, Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 22 data record.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

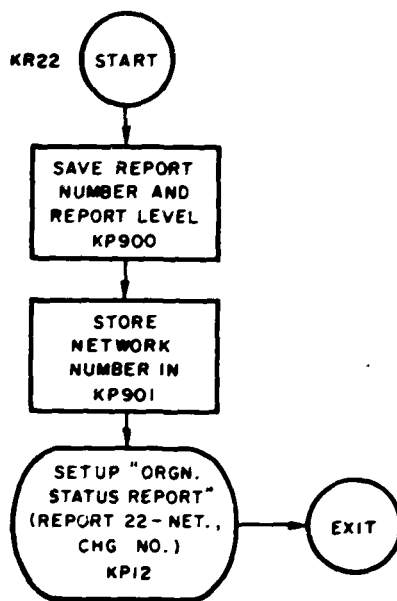
KP12

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION KR22

---



# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 22 (DATA)

| WORD               | 1          | 2            | 3                      | 4 | 5            | 6           |
|--------------------|------------|--------------|------------------------|---|--------------|-------------|
| DESCRIPTION        | REPORT NO. | REPORT LEVEL | REPORT LEVEL INDICATOR |   | SUMMARY FLAG | NETWORK NO. |
| CHARACTER LOCATION | 0 B17      | 0 B35        | (18H)                  |   | 1 0 B35      | (6H)        |

| WORD               | 7             | 8     | 9 | 10                | 11               | 12            |
|--------------------|---------------|-------|---|-------------------|------------------|---------------|
| DESCRIPTION        | CHARGE NUMBER |       |   | RESPONSIBLE ORGN. | PERFORMING ORGN. | RESOURCE CODE |
| CHARACTER LOCATION |               | (18H) |   | (6H)              | (6H)             | (4H)          |

WORD 13

FOR WORDS 13 THRU 43-SEE REPORT 10 (DATA) FORMAT

WORD 43

WORD

WORD

WORD

Fig. III-I-13. Tape Format of Report 22, Data

Region KR23

EXPLANATION OF REGION:

To select and set up sequence for sorting "Organization Status Report" by network number, responsible organization, charge number, performing organization, resource code (Report 23).

CALLING SEQUENCE:

L     TSX    KR23, 4  
L+1   Normal return

INPUT:

Accumulator: Report level, , Report number.  
YCNT: Location of PERT Cost data record.

OUTPUT:

Report 23 data record.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

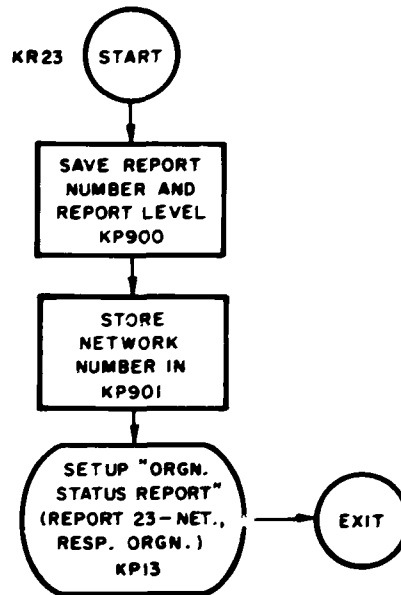
KP13

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION KR23

---





# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 23 (DATA)

| DESCRIPTION        | WORD 1            | WORD 2                                           | WORD 3                 | WORD 4        | WORD 5      | WORD 6  |
|--------------------|-------------------|--------------------------------------------------|------------------------|---------------|-------------|---------|
| CHARACTER LOCATION | REPORT NO.        | REPORT LEVEL                                     | REPORT LEVEL INDICATOR | SUMMARY FLAG  | NETWORK NO. |         |
| DESCRIPTION        | 0817              | 0835                                             | (18H)                  | 1 0835        | (6H)        |         |
| CHARACTER LOCATION | WORD 7            | WORD 8                                           | WORD 9                 | WORD 10       | WORD 11     | WORD 12 |
| DESCRIPTION        | RESPONSIBLE ORGN. | CHARGE NUMBER                                    | PERFORMING ORGN.       | RESOURCE CODE |             |         |
| CHARACTER LOCATION | (6H)              | (18H)                                            | (6H)                   | (4H)          |             |         |
| DESCRIPTION        | WORD 13           | FOR WORDS 13 THRU 43-SEE REPORT 10 (DATA) FORMAT |                        |               |             |         |
| CHARACTER LOCATION |                   |                                                  |                        |               |             |         |
| DESCRIPTION        | WORD              |                                                  |                        |               |             |         |
| CHARACTER LOCATION |                   |                                                  |                        |               |             |         |
| DESCRIPTION        | WORD              |                                                  |                        |               |             |         |
| CHARACTER LOCATION |                   |                                                  |                        |               |             |         |
| DESCRIPTION        | WORD              |                                                  |                        |               |             |         |
| CHARACTER LOCATION |                   |                                                  |                        |               |             |         |

Fig. III-I-14. Tape Format of Report 23, Data

Region KR30

EXPLANATION OF REGION:

To select and set up information for the initial sort of the "Management Summary Report" (Report 30).

CALLING SEQUENCE:

L TSX KR30, 4

L+1 Normal return

INPUT:

Accumulator: Report level, , Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 30 data record.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

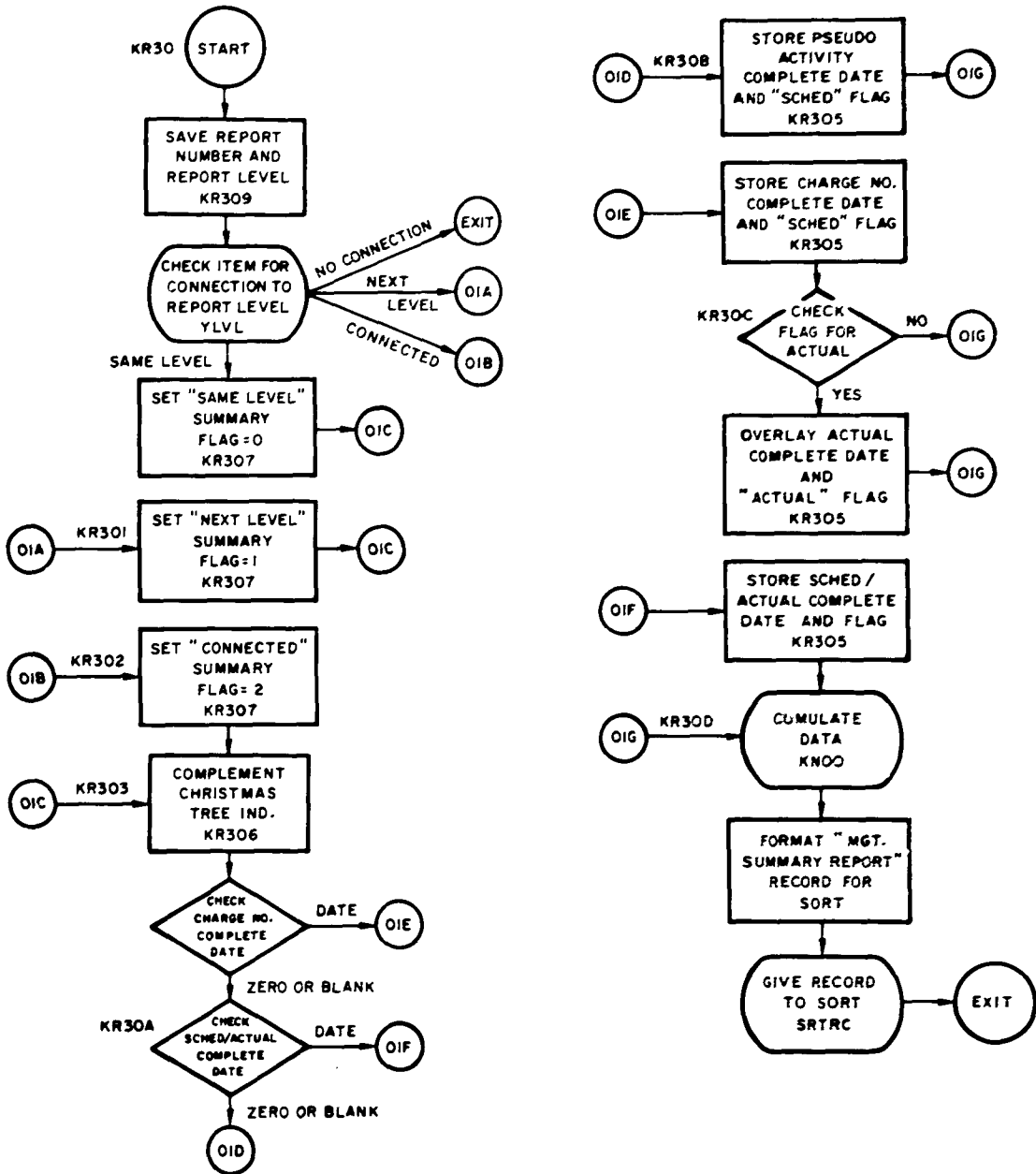
YLV L KN00

XSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION KR30



# RECORD FORMAT

| PROGRAM NUMBER     |                      | PERT COST            |                         | PAGE                             |                                          |
|--------------------|----------------------|----------------------|-------------------------|----------------------------------|------------------------------------------|
| NAME OF RECORD     |                      | REPORT 30            |                         |                                  |                                          |
| DESCRIPTION        | REPORT NO.           | REPORT LEVEL         | REPORT LEVEL INDICATOR  | CHRISTMAS TREE INDICATOR (COMP.) |                                          |
| CHARACTER LOCATION | 1                    | 2                    | 3                       | 4                                | 5                                        |
|                    | 7                    | 8                    | 9                       | 10                               | 11                                       |
| DESCRIPTION        | G.T.I. (CONT.)       | SUMMARY FLAG         | LEVEL                   | CHARGE NUMBER                    |                                          |
| CHARACTER LOCATION | 13                   | 14                   | 15                      | 16                               | 17                                       |
|                    | 18                   | 19                   | 20                      | 21                               | 22                                       |
| DESCRIPTION        | CONTRACTOR           | SLACK                | CRITICAL S <sub>L</sub> | CRITICAL S <sub>L</sub>          | T <sub>S</sub> /T <sub>A</sub> INDICATOR |
| CHARACTER LOCATION | 25                   | 26                   | 27                      | 28                               | 29                                       |
|                    | 30                   | 31                   | 32                      | 33                               | 34                                       |
| DESCRIPTION        | ACTUAL TOTAL DOLLARS | BUDGET TOTAL DOLLARS | ESTIMATE TOTAL DOLLARS  | OVER/UNDER TOTAL DOLLARS         |                                          |
| CHARACTER LOCATION | 35                   | 36                   | 37                      | 38                               | 39                                       |

Fig III-I-15. Tape Format of Report 30

Region KR35

**EXPLANATION OF REGION:**

To select and set up information for the initial sort of the "Program Project Status Report" (Report 35).

**CALLING SEQUENCE:**

L TSX KR35, 4

L+1 Normal return

**INPUT:**

Accumulator: Report level,, Report number.

YCNT: Location of PERT Cost data record.

**OUTPUT:**

Report 35 data record.

**STORAGE USED:**

Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

YLV L

KN00

XSORT

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.

Region KR35

EXPLANATION OF REGION:

To select and set up information for the initial sort of the "Program Project Status Report" (Report 35).

CALLING SEQUENCE:

L TSX KR35, 4

L+1 Normal return

INPUT:

Accumulator: Report level,, Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 35 data record.

STORAGE USED:

Not applicable.

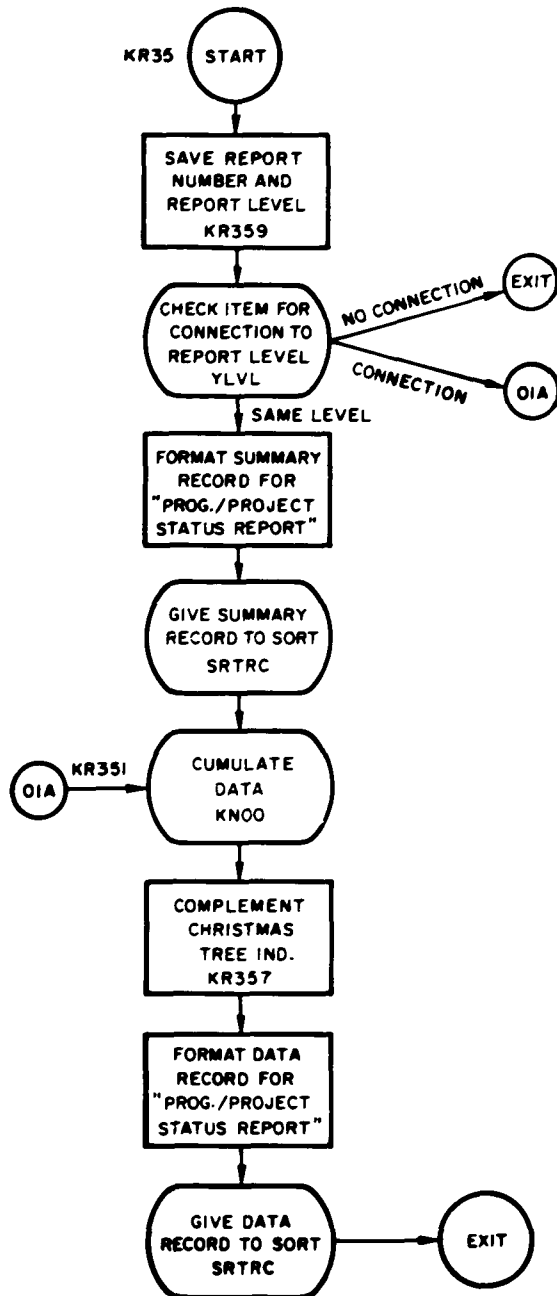
SUBREGIONS AND SUBROUTINES USED:

YLV L KN00

XSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable.



# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 35 (SUMMARY)

| DESCRIPTION | CHARACTER LOCATION | WORD       | 1                                | 2                      | 3             | 4             | 5             | 6             |
|-------------|--------------------|------------|----------------------------------|------------------------|---------------|---------------|---------------|---------------|
|             |                    | REPORT NO. | REPORT LEVEL                     | REPORT LEVEL INDICATOR | SUMMARY FLAG  | LEVEL         |               |               |
|             |                    | 0017       | 0035                             | (18H)                  | 0 0035        | 0035          |               |               |
| DESCRIPTION | CHARACTER LOCATION | WORD       | 7                                | 8                      | 9             | 10            | 11            | 12            |
|             |                    |            | CHARGE NUMBER                    | CHARGE NUMBER          | CHARGE NUMBER | CHARGE NUMBER | CHARGE NUMBER | CHARGE NUMBER |
|             |                    |            | (18H)                            |                        |               | (36H)         |               |               |
| DESCRIPTION | CHARACTER LOCATION | WORD       | 13                               | 14                     | 15            | 16            |               | 43            |
|             |                    |            | CHARGE NUMBER DESCRIPTOR (CONT.) | CONTRACTOR             |               |               |               |               |
|             |                    |            |                                  | (4H)                   |               |               |               |               |
| DESCRIPTION | CHARACTER LOCATION | WORD       |                                  |                        |               |               |               |               |
|             |                    |            |                                  |                        |               |               |               |               |
| DESCRIPTION | CHARACTER LOCATION | WORD       |                                  |                        |               |               |               |               |
|             |                    |            |                                  |                        |               |               |               |               |

Fig. III-I-16. Tape Format of Report 35, Summary



# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 35 (DATA)

| DESCRIPTION | CHARACTER LOCATION | WORD       | 1                     | 2                       | 3                     | 4                              | 5                                        | 6            |
|-------------|--------------------|------------|-----------------------|-------------------------|-----------------------|--------------------------------|------------------------------------------|--------------|
|             |                    | REPORT NO. | REPORT LEVEL          | REPORT LEVEL INDICATOR  |                       |                                | SUMMARY FLAG                             | C.T.I.       |
|             |                    | 0017       | 0035                  | (10H)                   |                       |                                | 1 0035                                   | (10H)        |
| DESCRIPTION | CHARACTER LOCATION | WORD       | 7                     | 8                       | 9                     | 10                             | 11                                       | 12           |
|             |                    |            | C.T.I. (CONT.)        | LEVEL                   |                       |                                | CHARGE NUMBER                            |              |
|             |                    |            |                       | 0035                    |                       |                                | (10H)                                    |              |
| DESCRIPTION | CHARACTER LOCATION | WORD       | 13                    | 14                      | 15                    | 16                             | 17                                       | 18           |
|             |                    |            |                       |                         |                       |                                | CHARGE NUMBER DESCRIPTOR                 |              |
|             |                    |            |                       |                         |                       |                                | (36H)                                    |              |
| DESCRIPTION | CHARACTER LOCATION | WORD       | 19                    | 20                      | 21                    | 22                             | 23                                       | 24           |
|             |                    |            | PREDECESSOR EVENT     |                         | SUCCESSOR EVENT       |                                | CRITICAL SUCC. EVENT                     |              |
|             |                    |            | (9H)                  |                         | (9H)                  |                                | (9H)                                     |              |
| DESCRIPTION | CHARACTER LOCATION | WORD       | 25                    | 26                      | 27                    | 28                             | 29                                       | 30           |
|             |                    |            | SCHED EXP. COMPL DATE | SCHED LATEST COMPL DATE | SCHED EXP. START DATE | T <sub>s</sub> /T <sub>a</sub> | T <sub>s</sub> /T <sub>a</sub> INDICATOR | SLACK        |
|             |                    |            | D D M M Y Y           | D D M M Y Y             | D D M M Y Y           | D D M M Y Y                    | (10H)                                    | WK x 10 0035 |

Fig. III-I-17. Tape Format of Report 35, Data

# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 2

NAME OF RECORD REPORT 35 (DATA) (CONT.)

|                    | WORD 31              | 32                   | 33                     |
|--------------------|----------------------|----------------------|------------------------|
| DESCRIPTION        | ACTUAL TOTAL DOLLARS | BUDGET TOTAL DOLLARS | ESTIMATE TOTAL DOLLARS |
| CHARACTER LOCATION | 0035                 | 0035                 | 0035                   |
| DESCRIPTION        |                      |                      |                        |
| CHARACTER LOCATION |                      |                      |                        |
| DESCRIPTION        |                      |                      |                        |
| CHARACTER LOCATION |                      |                      |                        |
| DESCRIPTION        |                      |                      |                        |
| CHARACTER LOCATION |                      |                      |                        |
| DESCRIPTION        |                      |                      |                        |
| CHARACTER LOCATION |                      |                      |                        |

Fig III-I-17. Tape Format of Report 35, Data (Continued)

Region KR40

EXPLANATION OF REGION:

To select and set up information for sorting the "Financial Plan and Status Report" (Reports 40 and 41).

CALLING SEQUENCE:

L TSX KR40, 4

L+1 Normal return

INPUT:

Accumulator: Report level, Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 40 data record (by month, charge number).

Report 41 data record (by month).

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

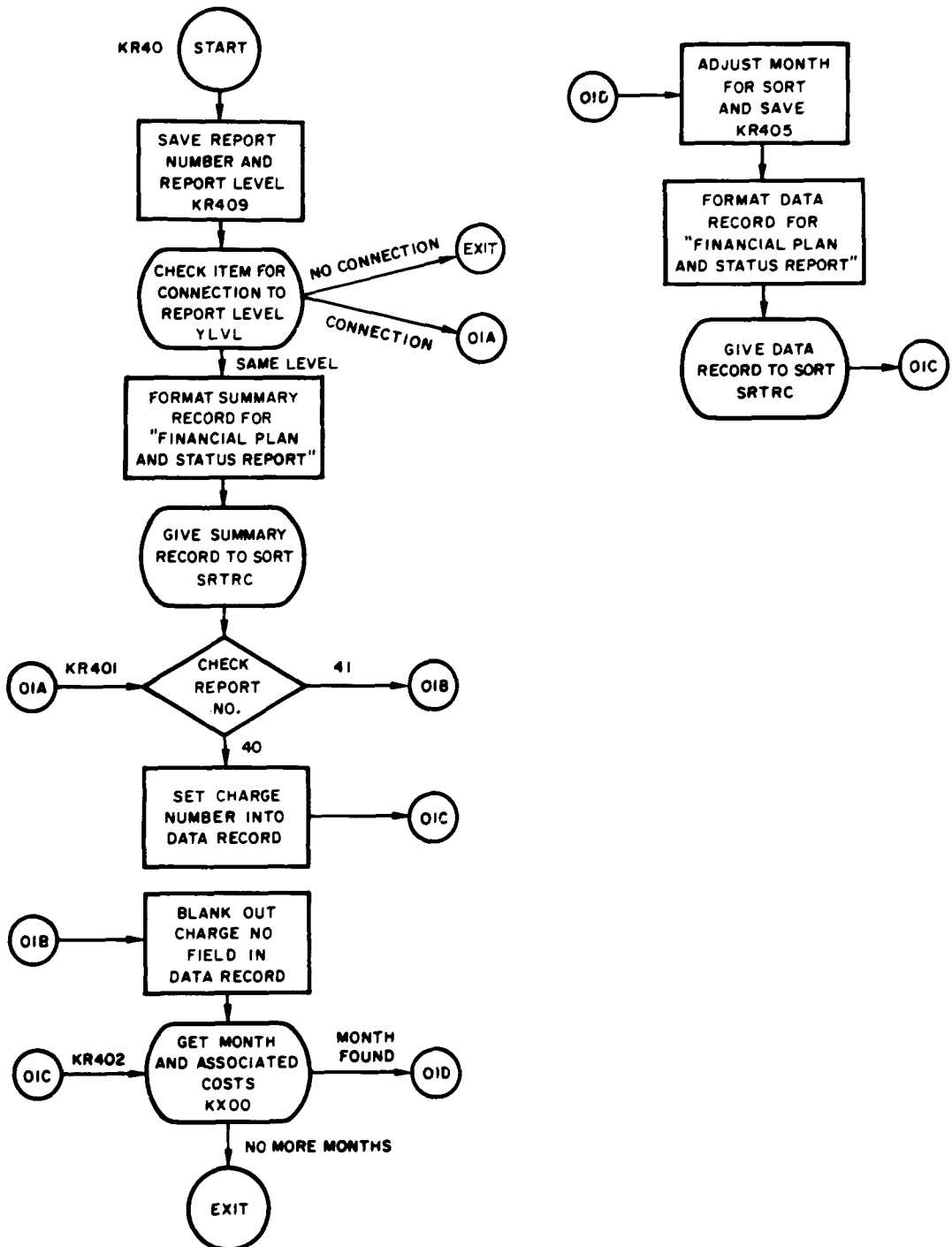
YLV L KX00

XSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION KR40



# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 40 & 41 (SUMMARY)

| DESCRIPTION        | 1                                | 2                        | 3                      | 4            | 5             | 6  |
|--------------------|----------------------------------|--------------------------|------------------------|--------------|---------------|----|
| CHARACTER LOCATION | REPORT NO.                       | REPORT LEVEL             | REPORT LEVEL INDICATOR | SUMMARY FLAG | CHARGE NUMBER |    |
|                    | 0017                             | 0035                     | (10H)                  | 0 0035       | (10H)         |    |
| DESCRIPTION        | 7                                | 8                        | 9                      | 10           | 11            | 12 |
| CHARACTER LOCATION | CHARGE NUMBER (CONT.)            | CHARGE NUMBER DESCRIPTOR |                        |              |               |    |
|                    |                                  | (36H)                    |                        |              |               |    |
| DESCRIPTION        | 13                               | 14                       | 15                     | 16           |               |    |
| CHARACTER LOCATION | CHARGE NUMBER DESCRIPTOR (CONT.) | LEVEL                    | CONTRACTOR             | (4H)         |               |    |
|                    |                                  | 0035                     |                        |              |               |    |
| DESCRIPTION        |                                  |                          |                        |              |               |    |
| CHARACTER LOCATION |                                  |                          |                        |              |               |    |
| DESCRIPTION        |                                  |                          |                        |              |               |    |
| CHARACTER LOCATION |                                  |                          |                        |              |               |    |

Fig. III-I-18. Tape Format of Reports 40 and 41, Summary

# RECORD FORMAT

| PROGRAM NUMBER     |                                  | PERT COST                |                          | PAGE         |               |
|--------------------|----------------------------------|--------------------------|--------------------------|--------------|---------------|
| NAME OF RECORD     |                                  | REPORT 40 & 41 (SUMMARY) |                          | 1            |               |
| DESCRIPTION        | REPORT NO.                       | REPORT LEVEL             | REPORT LEVEL INDICATOR   | SUMMARY FLAG | CHARGE NUMBER |
| CHARACTER LOCATION | 0017                             | 0B35                     | (18H)                    | 0 0B35       | (18H)         |
| DESCRIPTION        | CHARGE NUMBER (CONT.)            | CHARGE NUMBER (CONT.)    | CHARGE NUMBER DESCRIPTOR |              |               |
| CHARACTER LOCATION |                                  |                          | (36H)                    |              |               |
| DESCRIPTION        | CHARGE NUMBER DESCRIPTOR (CONT.) | LEVEL                    | CONTRACTOR               |              |               |
| CHARACTER LOCATION |                                  | 0B35                     | (4H)                     |              |               |
| DESCRIPTION        |                                  |                          |                          |              |               |
| CHARACTER LOCATION |                                  |                          |                          |              |               |
| DESCRIPTION        |                                  |                          |                          |              |               |
| CHARACTER LOCATION |                                  |                          |                          |              |               |

Fig. III-I-18. Tape Format of Reports 40 and 41, Summary

# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 40 & 41 (DATA)

| DESCRIPTION        | 1                | 2                 | 3                      | 4                 | 5            | 6  |
|--------------------|------------------|-------------------|------------------------|-------------------|--------------|----|
| CHARACTER LOCATION | REPORT NO.       | REPORT LEVEL      | REPORT LEVEL INDICATOR | SUMMARY FLAG      | CHARGE MONTH |    |
|                    | 0817             | 0835              | (18H)                  | 1 0835            | Y Y M M      |    |
| DESCRIPTION        | 7                | 8                 | 9                      | 10                | 11           | 12 |
| CHARACTER LOCATION | CHARGE NUMBER    | ACT. DIR. (INCR.) | BUD. DIR. (INCR.)      | EST. DIR. (INCR.) |              |    |
|                    | (18H)            | 0835              | 0835                   | 0835              |              |    |
| DESCRIPTION        | 13               | 14                | 15                     |                   |              |    |
| CHARACTER LOCATION | ACT. TOT. (CUM.) | BUD. TOT. (CUM.)  | EST. TOT. (CUM.)       |                   |              |    |
|                    | 0836             | 0835              | 0835                   |                   |              |    |
| DESCRIPTION        |                  |                   |                        |                   |              |    |
| CHARACTER LOCATION |                  |                   |                        |                   |              |    |
| DESCRIPTION        |                  |                   |                        |                   |              |    |
| CHARACTER LOCATION |                  |                   |                        |                   |              |    |

Fig. III-I-19. Tape Format of Reports 40 and 41, Data

Region KR50

**EXPLANATION OF REGION:**

To select and set up information for sorting the "Manpower Loading Report" (Reports 50 and 51).

**CALLING SEQUENCE:**

L TSX KR50, 4

**L+1    Normal return**

**INPUT:**

**Accumulator: Report level,, Report number.**

**YCNT:** Location of PERT Cost data record.

**OUTPUT:**

Report 50 data record (by resource code, month, perf. org., charge no.)

Report 51 data record (by resource code, month)

**STORAGE USED:**

Not applicable.

### SUBREGIONS AND SUBROUTINES USED:

YLVL KX00

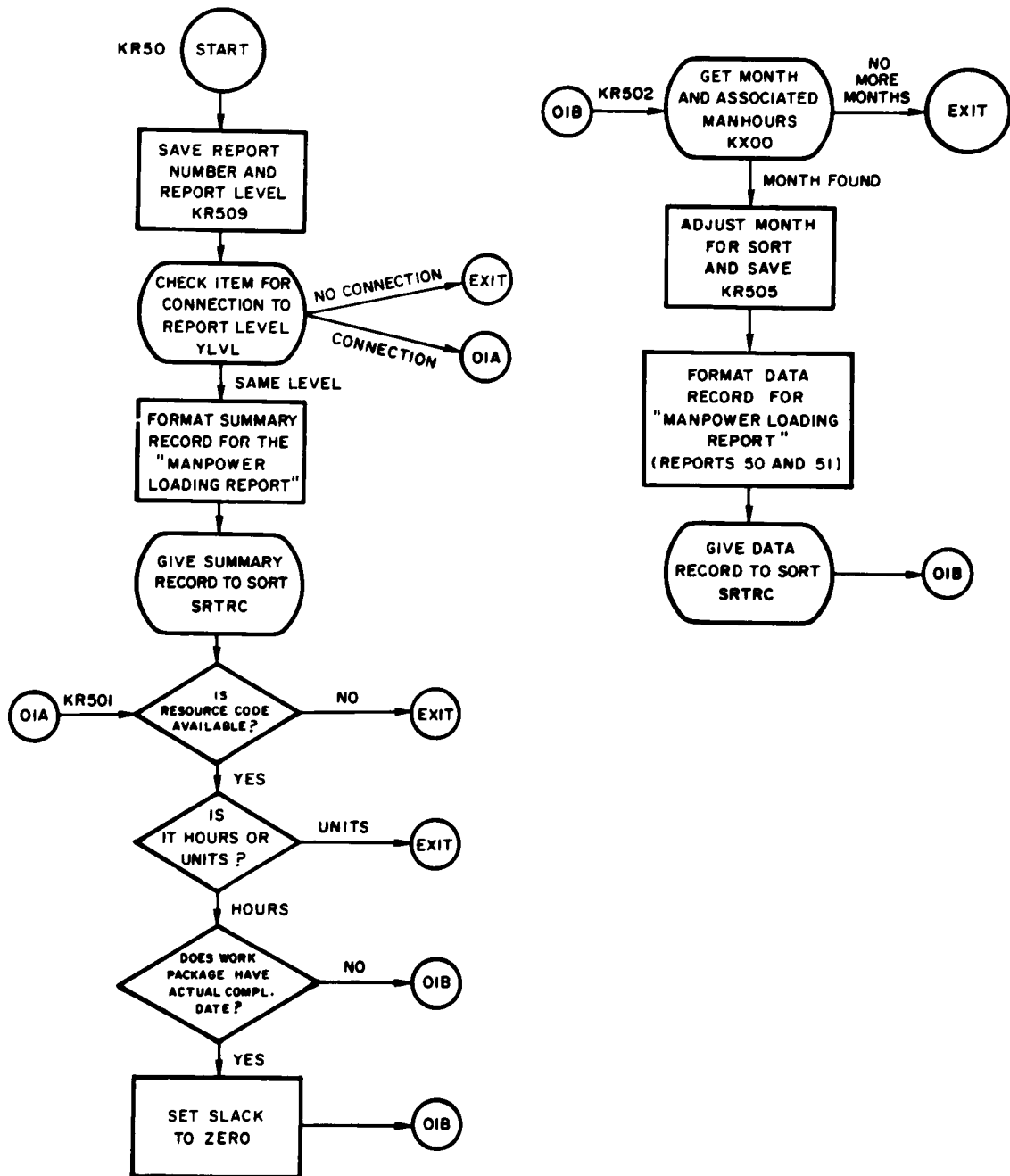
## XSORT

**EXPLANATION OF CALLING SEQUENCE:**

**Not applicable.**



REGION KR50



# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 50 & 51

| DESCRIPTION | CHARACTER LOCATION | WORD         | 1                | 2                      | 3            | 4             | 5  | 6  |
|-------------|--------------------|--------------|------------------|------------------------|--------------|---------------|----|----|
|             |                    | REPORT NO.   | REPORT LEVEL     | REPORT LEVEL INDICATOR | SUMMARY FLAG | RESOURCE CODE |    |    |
|             |                    | 8817         | 8835             | (18H)                  | 1 8835       | (4H)          |    |    |
|             |                    | WORD         | 7                | 8                      | 9            | 10            | 11 | 12 |
| DESCRIPTION |                    | CHARGE MONTH | PERFORMING ORGN. | CHARGE NUMBER          | SLACK        |               |    |    |
|             |                    | Y Y          | M M              | (6H)                   | (18H)        | WK x 10 8835  |    |    |
|             |                    | WORD         | 13               | 14                     | 15           |               |    |    |
| DESCRIPTION |                    | ACTUAL HOURS | BUDGET HOURS     | ESTIMATE HOURS         |              |               |    |    |
|             |                    | 8835         | 8835             | 8835                   |              |               |    |    |
|             |                    | WORD         |                  |                        |              |               |    |    |
| DESCRIPTION |                    |              |                  |                        |              |               |    |    |
|             |                    | WORD         |                  |                        |              |               |    |    |
| DESCRIPTION |                    |              |                  |                        |              |               |    |    |
|             |                    | WORD         |                  |                        |              |               |    |    |
| DESCRIPTION |                    |              |                  |                        |              |               |    |    |
|             |                    | WORD         |                  |                        |              |               |    |    |

Fig. III-I-20. Tape Format of Reports 50 and 51, Data

Region KR52

EXPLANATION OF REGION:

To select and set up information for sorting the "Manpower Loading Report" by performing organization, month, resource code (Report 52).

CALLING SEQUENCE:

L TSX KR52, 4

L+1 Normal return

INPUT:

Accumulator: Report level,, Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 52 data record.

STORAGE USED:

Not applicable.

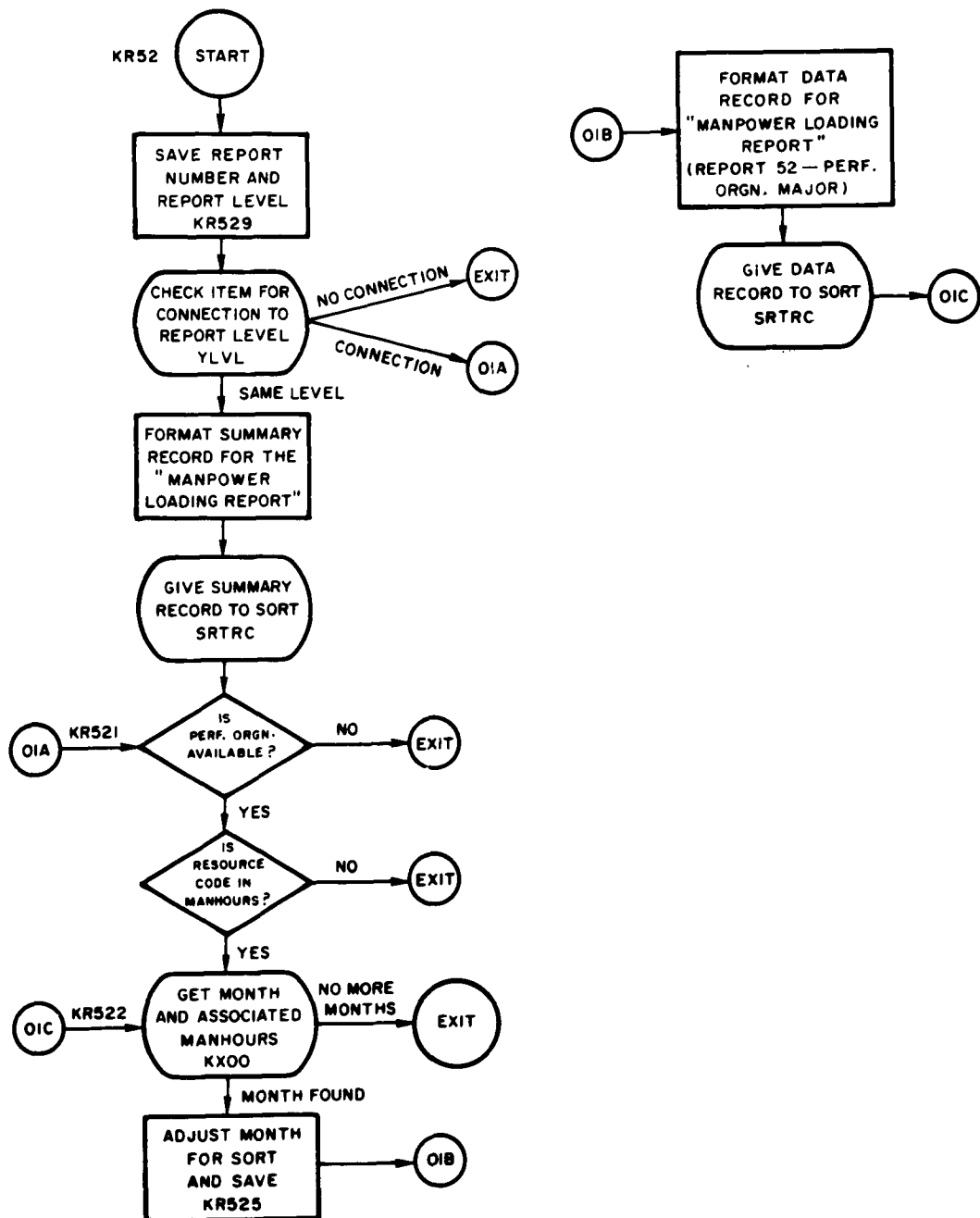
SUBREGIONS AND SUBROUTINES USED:

YLVL KX00

XSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable.



# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 52 (DATA)

|                    | 1            | 2             | 3                      | 4            | 5              | 6                |
|--------------------|--------------|---------------|------------------------|--------------|----------------|------------------|
| DESCRIPTION        | REPORT NO.   | REPORT LEVEL  | REPORT LEVEL INDICATOR |              | SUMMARY FLAG   | PERFORMING ORGN. |
| CHARACTER LOCATION | @B17         | @B35          | (10H)                  |              | I @B35         | (6H)             |
|                    | 7            | 8             | 9                      | 10           | 11             |                  |
| DESCRIPTION        | CHARGE MONTH | RESOURCE CODE | ACTUAL HOURS           | BUDGET HOURS | ESTIMATE HOURS |                  |
| CHARACTER LOCATION | Y Y M M      | (4H)          | @B35                   | @B35         | @B35           |                  |
| DESCRIPTION        |              |               |                        |              |                |                  |
| CHARACTER LOCATION |              |               |                        |              |                |                  |
| DESCRIPTION        |              |               |                        |              |                |                  |
| CHARACTER LOCATION |              |               |                        |              |                |                  |
| DESCRIPTION        |              |               |                        |              |                |                  |
| CHARACTER LOCATION |              |               |                        |              |                |                  |

Fig. III-I-21. Tape Format of Report 52, Data

Region KR55

EXPLANATION OF REGION:

To select and set up information for sorting the "Rainbow Category Report" (Report 55).

CALLING SEQUENCE:

L TSX KR55, 4

L+1 Normal return

INPUT:

Accumulator: Report level, , Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 55 data record.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

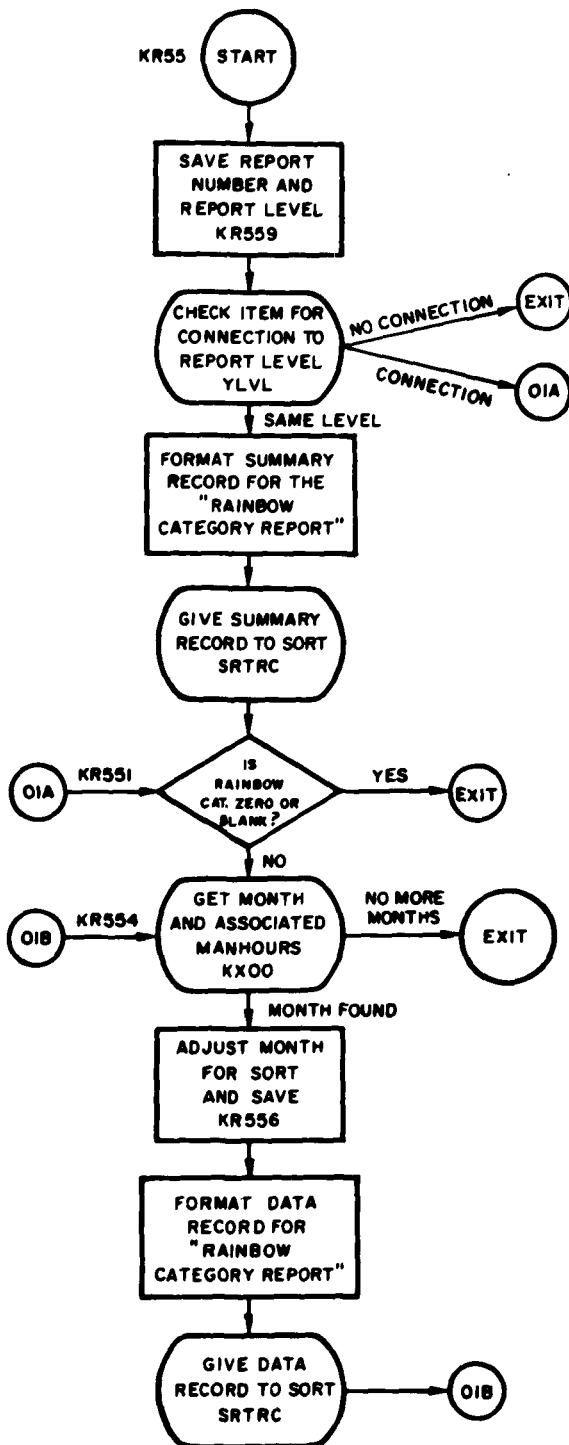
YLV L KX00

XSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION KR55



# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 55 (DATA)

|                    | WORD 1         | WORD 2                   | WORD 3                 | WORD 4       | WORD 5       | WORD 6           |
|--------------------|----------------|--------------------------|------------------------|--------------|--------------|------------------|
| DESCRIPTION        | REPORT NO.     | REPORT LEVEL             | REPORT LEVEL INDICATOR | SUMMARY FLAG |              | RAINBOW CATEGORY |
| CHARACTER LOCATION | 0017           | 0035                     | (18H)                  | 1 0035       |              | (24H)            |
|                    | WORD 7         | WORD 8                   | WORD 9                 | WORD 10      | WORD 11      | WORD 12          |
| DESCRIPTION        |                | RAINBOW CATEGORY (CONT.) |                        | CHARGE MONTH | ACTUAL HOURS | BUDGET HOURS     |
| CHARACTER LOCATION |                |                          |                        | Y Y M M      | 0035         | 0035             |
|                    | WORD 13        |                          |                        |              |              |                  |
| DESCRIPTION        | ESTIMATE HOURS |                          |                        |              |              |                  |
| CHARACTER LOCATION | 0035           |                          |                        |              |              |                  |
|                    | WORD           |                          |                        |              |              |                  |
| DESCRIPTION        |                |                          |                        |              |              |                  |
| CHARACTER LOCATION |                |                          |                        |              |              |                  |
|                    | WORD           |                          |                        |              |              |                  |
| DESCRIPTION        |                |                          |                        |              |              |                  |
| CHARACTER LOCATION |                |                          |                        |              |              |                  |

Fig. III-I-22. Tape Format of Report 55, Data



Region KR60

EXPLANATION OF REGION:

To select and set up information for sorting the "Cost Category Status Report" (Report 60).

CALLING SEQUENCE:

L TSX KR60, 4

L+1 Normal return

INPUT:

Accumulator: Report level, Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 60 data record.

STORAGE USED:

Not applicable.

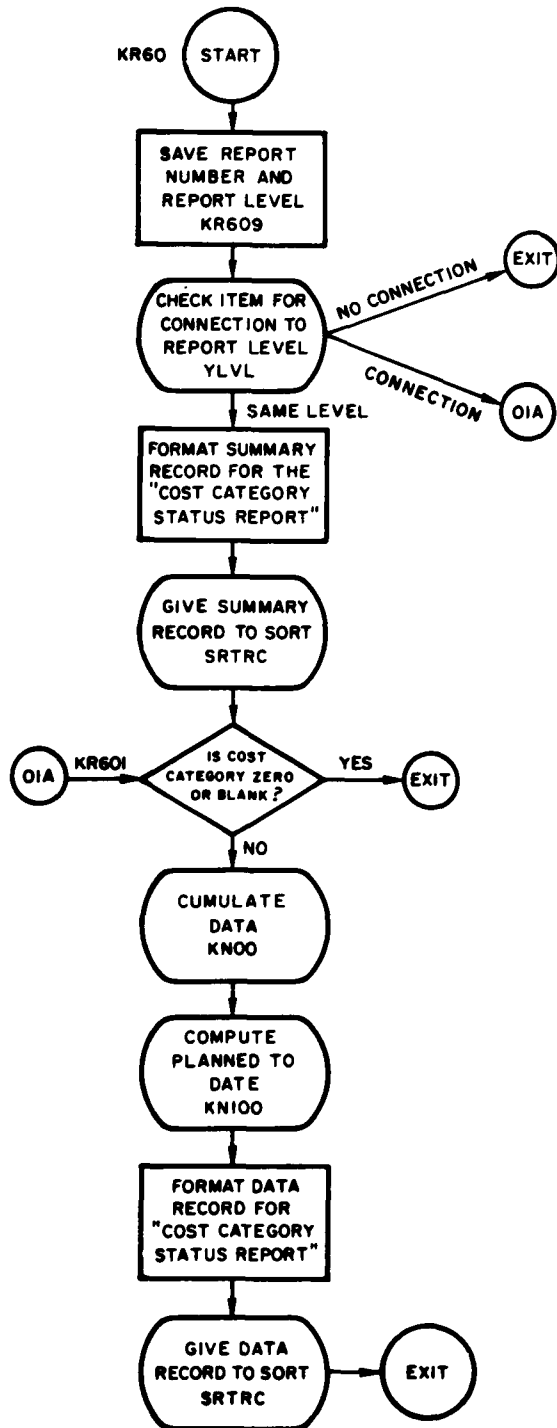
SUBREGIONS AND SUBROUTINES USED:

YLVL KN00

KN100 XSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable.



# RECORD FORMAT

|                |                    |                       |                 |                        |                      |                    |    |               |
|----------------|--------------------|-----------------------|-----------------|------------------------|----------------------|--------------------|----|---------------|
| PROGRAM NUMBER |                    | PERT COST             |                 | PAGE                   |                      | 1                  |    |               |
| NAME OF RECORD |                    | REPORT 60 (DATA)      |                 |                        |                      |                    |    |               |
| DESCRIPTION    | CHARACTER LOCATION | WORD                  | 1               | 2                      | 3                    | 4                  | 5  | 6             |
|                |                    | REPORT NO.            | REPORT LEVEL    | REPORT LEVEL INDICATOR |                      | SUMMARY FLAG       |    | COST CATEGORY |
|                |                    | 0017                  | 0035            | (18H)                  |                      | 1 0035             |    | (18H)         |
| DESCRIPTION    | CHARACTER LOCATION | WORD                  | 7               | 8                      | 9                    | 10                 | 11 | 12            |
|                |                    | COST CATEGORY (CONT.) | ACTUAL HOURS    | BUDGET HOURS           | ESTIMATE HOURS       | PLAN HOURS TO DATE |    |               |
|                |                    |                       | 0035            | 0035                   | 0035                 | 0035               |    | 0035          |
| DESCRIPTION    | CHARACTER LOCATION | WORD                  | 13              | 14                     | 15                   | 16                 |    |               |
|                |                    | ACTUAL TOTAL \$       | BUDGET TOTAL \$ | ESTIMATE TOTAL \$      | PLAN TOT. \$ TO DATE |                    |    |               |
|                |                    | 0035                  | 0035            | 0035                   | 0035                 |                    |    |               |
| DESCRIPTION    | CHARACTER LOCATION | WORD                  |                 |                        |                      |                    |    |               |
| DESCRIPTION    | CHARACTER LOCATION | WORD                  |                 |                        |                      |                    |    |               |
| DESCRIPTION    | CHARACTER LOCATION | WORD                  |                 |                        |                      |                    |    |               |
| DESCRIPTION    | CHARACTER LOCATION | WORD                  |                 |                        |                      |                    |    |               |
| DESCRIPTION    | CHARACTER LOCATION | WORD                  |                 |                        |                      |                    |    |               |

Fig III-I-23. Tape Format of Report 60, Data

Region KR70

EXPLANATION OF REGION:

To select and set up information for sorting the "Summary Financial Forecast" by summary item (Reports 70 and 75).

CALLING SEQUENCE:

L TSX KR70, 4  
L+1 Normal return

INPUT:

Accumulator: Report level, , Report number.  
YCNT: Location of PERT Cost data record.

OUTPUT:

Report 70 data record (by summary item, fiscal year).  
Report 75 data record (by summary item, months of current fiscal year).

STORAGE USED:

Not applicable.

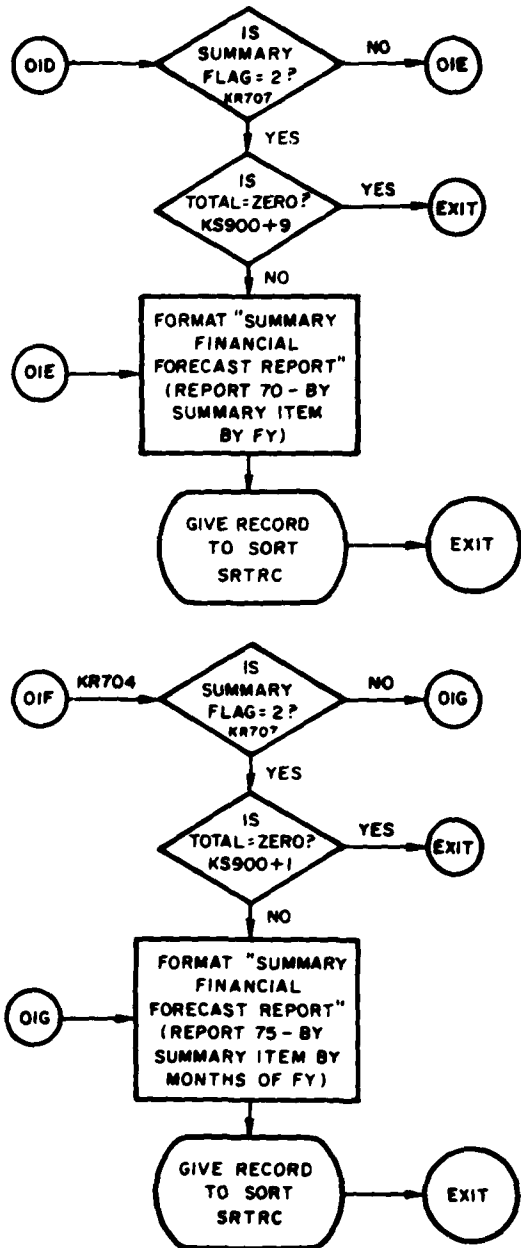
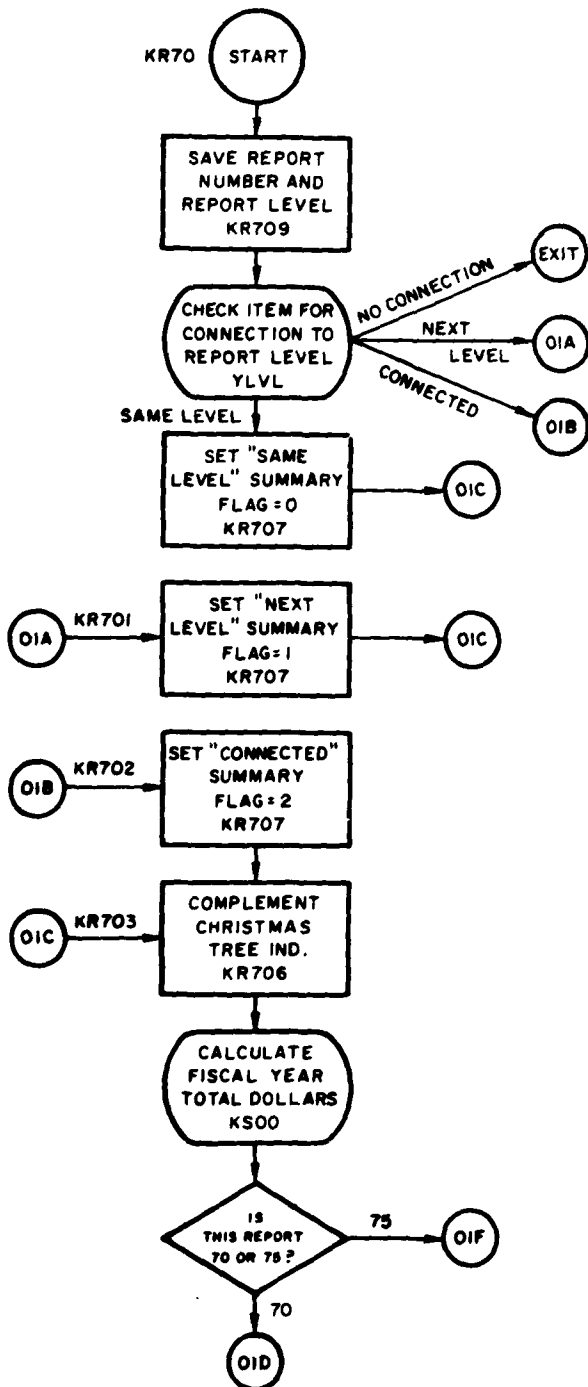
SUBREGIONS AND SUBROUTINES USED:

YLVL KS00  
XSORT

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

# REGION KR70



# RECORD FORMAT

PROGRAM NUMBER \_\_\_\_\_ PERT COST \_\_\_\_\_ PAGE 1

NAME OF RECORD \_\_\_\_\_ REPORT 70

|                    |                  |              |                        |                    |                          |              |
|--------------------|------------------|--------------|------------------------|--------------------|--------------------------|--------------|
| DESCRIPTION        | WORD 1           | 2            | 3                      | 4                  | 5                        | 6            |
|                    | REPORT NO.       | REPORT LEVEL | REPORT LEVEL INDICATOR |                    | CHRISTMAS TREE INDICATOR |              |
| CHARACTER LOCATION | 7                | 8            | 9                      | 10                 | 11                       | 12           |
|                    | 0817             | 0835         | (18H)                  |                    | (18H)                    |              |
| DESCRIPTION        | WORD 13          | 14           | 15                     | 16                 | 17                       | 18           |
|                    | C. T. I. (CONT.) | SUMMARY FLAG | LEVEL                  |                    | CHARGE NUMBER            |              |
| CHARACTER LOCATION | 19               | 20           | 21                     | 22                 | 23                       | 24           |
|                    | 0835             | 0835         | 0835                   | 0835               | 0835                     | 0835         |
| DESCRIPTION        | WORD 25          | 26           | 27                     | 28                 | 29                       |              |
|                    | CONTRACTOR       | PRIOR FYS    | CURRENT FY             | CURRENT FY+1       | CURRENT FY+2             | CURRENT FY+3 |
| CHARACTER LOCATION | 30               | 31           | 32                     | 33                 | 34                       | 35           |
|                    | (4H)             | 0835         | 0835                   | 0835               | 0835                     | 0835         |
| DESCRIPTION        | WORD 36          | 37           | 38                     | 39                 | 40                       |              |
|                    | CURRENT FY+4     | CURRENT FY+5 | CURRENT FY+6           | TOTALS TO COMPLETE | TOTAL                    |              |
| CHARACTER LOCATION | 41               | 42           | 43                     | 44                 | 45                       | 46           |
|                    | 0835             | 0835         | 0835                   | 0835               | 0835                     | 0835         |

Fig. III-I-24. Tape Format of Report 70

# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 75

| DESCRIPTION        | WORD 1         | WORD 2       | WORD 3                   | WORD 4  | WORD 5                   | WORD 6  |
|--------------------|----------------|--------------|--------------------------|---------|--------------------------|---------|
|                    | REPORT NO.     | REPORT LEVEL | REPORT LEVEL INDICATOR   |         | CHRISTMAS TREE INDICATOR |         |
| CHARACTER LOCATION | 0817           | 0835         | (18H)                    |         | (18H)                    |         |
| DESCRIPTION        | WORD 7         | WORD 8       | WORD 9                   | WORD 10 | WORD 11                  | WORD 12 |
|                    | C.T.I. (CONT.) | SUMMARY FLAG | LEVEL                    |         | CHARGE NUMBER            |         |
| CHARACTER LOCATION |                | 0835         | 0835                     |         | (18H)                    |         |
| DESCRIPTION        | WORD 13        | WORD 14      | WORD 15                  | WORD 16 | WORD 17                  | WORD 18 |
|                    |                |              | CHARGE NUMBER DESCRIPTOR |         |                          |         |
| CHARACTER LOCATION |                |              | (30H)                    |         |                          |         |
| DESCRIPTION        | WORD 19        | WORD 20      | WORD 21                  | WORD 22 | WORD 23                  | WORD 24 |
|                    | CONTRACTOR     | CURRENT FY   | MONTHS OF FISCAL YEAR    |         |                          |         |
| CHARACTER LOCATION | (4H)           | 0835         |                          |         |                          |         |
| DESCRIPTION        | WORD 25        | WORD 26      | WORD 27                  | WORD 28 | WORD 29                  | WORD 30 |
|                    |                |              |                          |         |                          |         |
| CHARACTER LOCATION |                |              |                          |         |                          |         |

Fig. III-I-25. Tape Format of Report 75

# RECORD FORMAT

PROGRAM NUMBER PERT COST

PAGE 1

NAME OF RECORD REPORT 75

|                    |                |              |                        |                          |                          |    |    |
|--------------------|----------------|--------------|------------------------|--------------------------|--------------------------|----|----|
|                    | WORD           | 1            | 2                      | 3                        | 4                        | 5  | 6  |
| DESCRIPTION        | REPORT NO.     | REPORT LEVEL | REPORT LEVEL INDICATOR |                          | CHRISTMAS TREE INDICATOR |    |    |
| CHARACTER LOCATION | 0817           | 0835         | (18H)                  |                          | (18H)                    |    |    |
|                    | WORD           | 7            | 8                      | 9                        | 10                       | 11 | 12 |
| DESCRIPTION        | C.T.I. (CONT.) | SUMMARY FLAG | LEVEL                  |                          | CHARGE NUMBER            |    |    |
| CHARACTER LOCATION |                | 0835         | 0835                   |                          | (18H)                    |    |    |
|                    | WORD           | 13           | 14                     | 15                       | 16                       | 17 | 18 |
| DESCRIPTION        |                |              |                        | CHARGE NUMBER DESCRIPTOR |                          |    |    |
| CHARACTER LOCATION |                |              |                        | (36H)                    |                          |    |    |
|                    | WORD           | 19           | 20                     | 21                       | 22                       | 32 |    |
| DESCRIPTION        | CONTRACTOR     | CURRENT FY   | MONTHS OF FISCAL YEAR  |                          |                          |    |    |
| CHARACTER LOCATION | (4H)           | 0835         |                        |                          |                          |    |    |
|                    | WORD           |              |                        |                          |                          |    |    |
| DESCRIPTION        |                |              |                        |                          |                          |    |    |
| CHARACTER LOCATION |                |              |                        |                          |                          |    |    |

Fig. III-I-25. Tape Format of Report 75



## Region KR71

EXPLANATION OF REGION:

To select and set up information for sorting the "Summary Financial Forecast" by cost category (Reports 71 and 76).

**CALLING SEQUENCE:**

L TSX KR71, 4

L+1 Normal return

INPUT:

**Accumulator:** Report level,, Report number.

YCNT: Location of PERT Cost data record.

**OUTPUT:**

Report 71 data record (by cost category, fiscal year).

Report 76 data record (by cost category, months of current fiscal year).

STORAGE USED:

Not applicable.

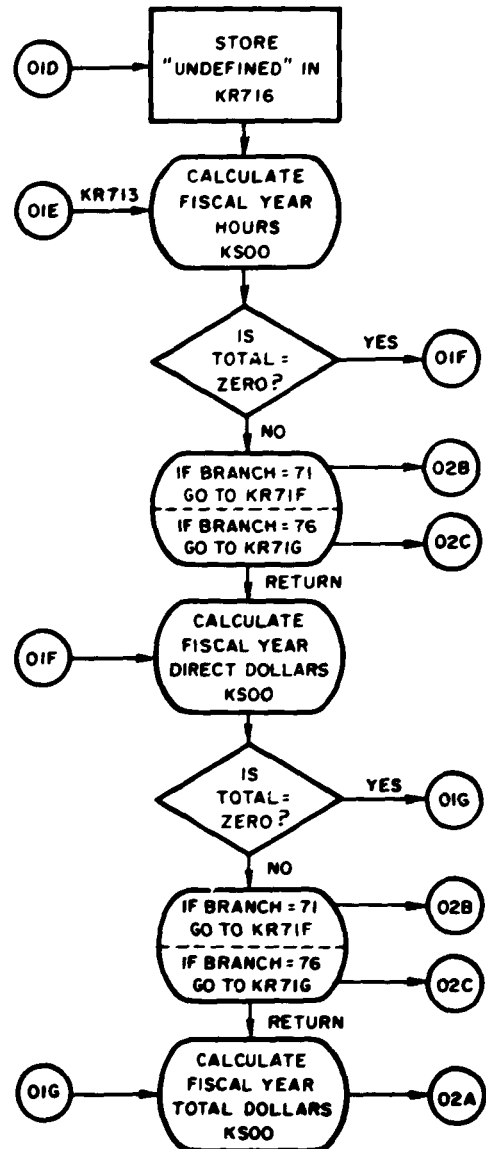
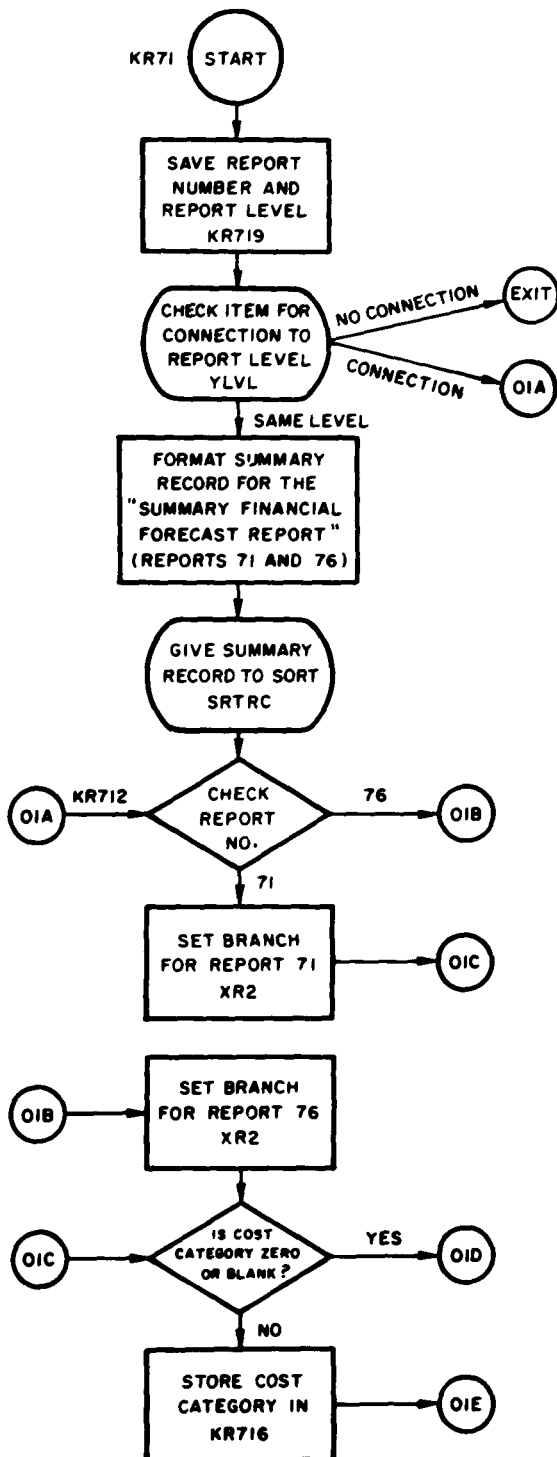
**SUBREGIONS AND SUBROUTINES USED:**

YLVL KS00

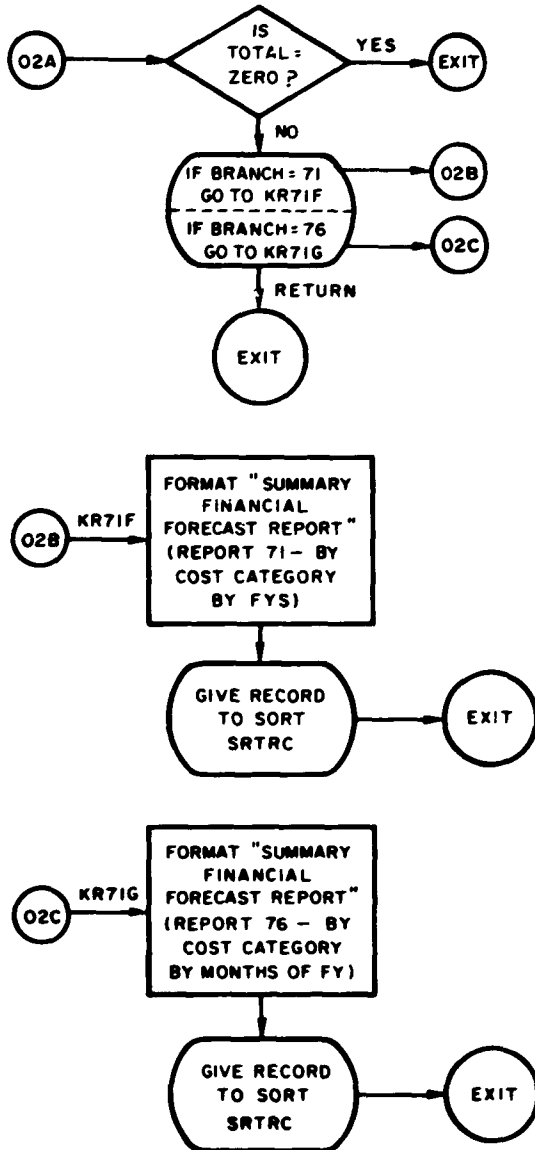
XSORT

**EXPLANATION OF CALLING SEQUENCE:**

**Not applicable.**



REGION KR7I



# RECORD FORMAT

PROGRAM NUMBER PERT COST

PAGE 1

NAME OF RECORD REPORT 71 & 76 (SUMMARY)

|                    | 1         | 2                                | 3                      | 4                        | 5            | 6     |
|--------------------|-----------|----------------------------------|------------------------|--------------------------|--------------|-------|
| DESCRIPTION        | REPORT NO | REPORT LEVEL                     | REPORT LEVEL INDICATOR |                          | SUMMARY FLAG | LEVEL |
| CHARACTER LOCATION | 0817      | 0835                             | (18H)                  |                          | 0 0835       | 0835  |
| DESCRIPTION        | WORD 7    | 8                                | 9                      | 10                       | 11           | 12    |
|                    |           | CHARGE NUMBER                    |                        | CHARGE NUMBER DESCRIPTOR |              |       |
| CHARACTER LOCATION |           | (18H)                            |                        |                          | (36H)        |       |
| DESCRIPTION        | WORD 13   | 14                               | 15                     | 16                       |              |       |
|                    |           | CHARGE NUMBER DESCRIPTOR (CONT.) | CONTRACTOR             |                          |              |       |
| CHARACTER LOCATION |           |                                  | (4H)                   |                          |              |       |
| DESCRIPTION        | WORD      |                                  |                        |                          |              |       |
| CHARACTER LOCATION |           |                                  |                        |                          |              |       |
| DESCRIPTION        | WORD      |                                  |                        |                          |              |       |
| CHARACTER LOCATION |           |                                  |                        |                          |              |       |

Fig. III-I-26. Tape Format of Reports 71 and 76, Summary

# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 71 (DATA)

| DESCRIPTION | CHARACTER LOCATION | WORD                  | 1              | 2                      | 3            | 4             | 5                  | 6  |
|-------------|--------------------|-----------------------|----------------|------------------------|--------------|---------------|--------------------|----|
|             |                    | REPORT NO.            | REPORT LEVEL   | REPORT LEVEL INDICATOR | SUMMARY FLAG | COST CATEGORY |                    |    |
|             |                    | 0817                  | 0835           | (18H)                  | 1 0835       | (18H)         |                    |    |
| DESCRIPTION | CHARACTER LOCATION | WORD                  | 7              | 8                      | 9            | 10            | 11                 | 12 |
|             |                    | COST CATEGORY (CONT.) | COST CAT. CODE | PRIOR FYS              | CURRENT FY   | CURRENT FY+1  |                    |    |
|             |                    |                       | (6H)           | 0835                   | 0835         | 0835          |                    |    |
| DESCRIPTION | CHARACTER LOCATION | WORD                  | 13             | 14                     | 15           | 16            | 17                 | 18 |
|             |                    | CURRENT FY+2          | CURRENT FY+3   | CURRENT FY+4           | CURRENT FY+5 | CURRENT FY+6  | TOTALS TO COMPLETE |    |
|             |                    | 0835                  | 0835           | 0835                   | 0835         | 0835          | 0835               |    |
| DESCRIPTION | CHARACTER LOCATION | WORD                  | 19             |                        |              |               |                    |    |
|             |                    | TOTAL                 |                |                        |              |               |                    |    |
|             |                    | 0835                  |                |                        |              |               |                    |    |
| DESCRIPTION | CHARACTER LOCATION | WORD                  |                |                        |              |               |                    |    |
|             |                    |                       |                |                        |              |               |                    |    |
|             |                    |                       |                |                        |              |               |                    |    |

Fig. III-I-27. Tape Format of Report 71, Data

# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 76 (DATA)

|                    | 1                     | 2               | 3                      | 4                     | 5             | 6  |
|--------------------|-----------------------|-----------------|------------------------|-----------------------|---------------|----|
| DESCRIPTION        | REPORT NO.            | REPORT LEVEL    | REPORT LEVEL INDICATOR | SUMMARY FLAG          | COST CATEGORY |    |
| CHARACTER LOCATION | 0917                  | 0835            | (18H)                  | 1 @ 835               |               |    |
|                    | WORD 7                | 8               | 9                      | 10                    | 11            | 22 |
| DESCRIPTION        | COST CATEGORY (CONT.) | COST. CAT. CODE | CURRENT FY             | MONTHS OF FISCAL YEAR |               |    |
| CHARACTER LOCATION |                       | (6H)            | 0835                   |                       |               |    |
| DESCRIPTION        |                       |                 |                        |                       |               |    |
| CHARACTER LOCATION |                       |                 |                        |                       |               |    |
| DESCRIPTION        |                       |                 |                        |                       |               |    |
| CHARACTER LOCATION |                       |                 |                        |                       |               |    |
| DESCRIPTION        |                       |                 |                        |                       |               |    |
| CHARACTER LOCATION |                       |                 |                        |                       |               |    |

Fig. III-I-28. Tape Format of Report 76, Data

Region KR80

EXPLANATION OF REGION:

To select and set up information for sorting the "Budget Authorization and Updating Form" (Report 80) and "Cost Estimating and Updating Form" (Report 85).

CALLING SEQUENCE:

L TSX KR80, 4

L+1 Normal return

INPUT:

Accumulator: 0,, Report number.

YCNT: Location of PERT Cost data record.

OUTPUT:

Report 80 data record.

Report 85 data record.

STORAGE USED:

Not applicable.

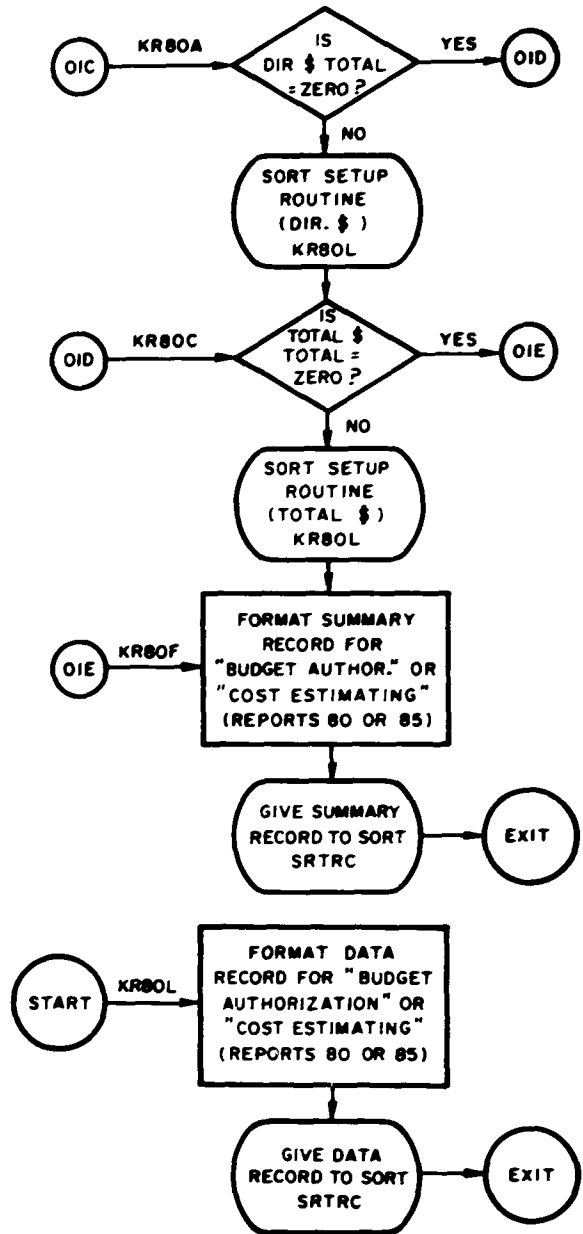
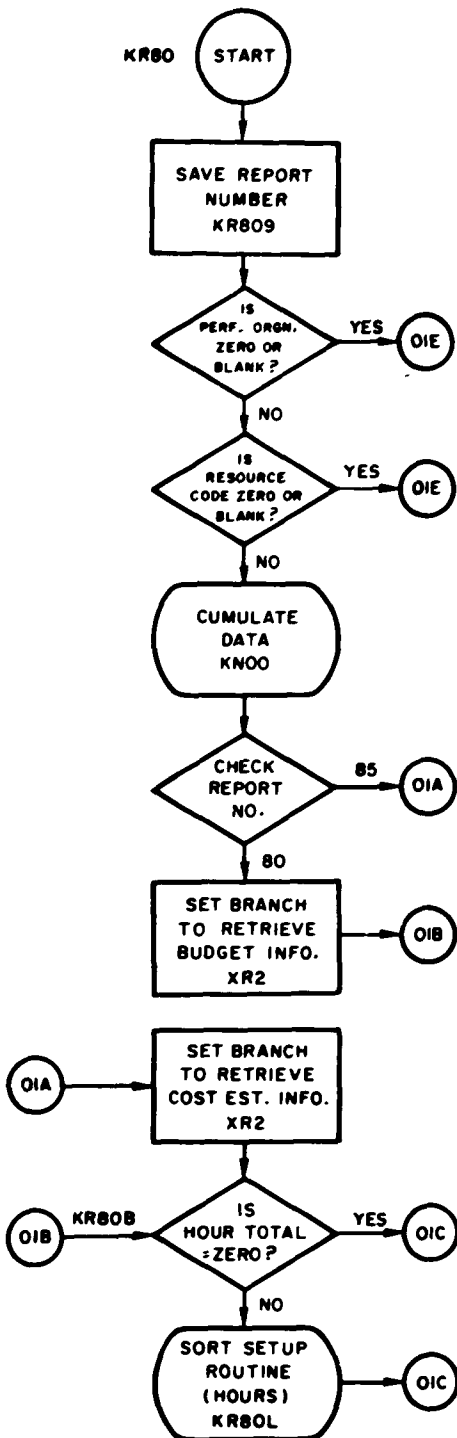
SUBREGIONS AND SUBROUTINES USED:

KN00

XSORT

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.





# RECORD FORMAT

|                    |                              |                          |                                 |               |  |
|--------------------|------------------------------|--------------------------|---------------------------------|---------------|--|
| PROGRAM NUMBER     |                              | PERT COST                |                                 | PAGE          |  |
| NAME OF RECORD     |                              | REPORT 80 & 85 (SUMMARY) |                                 |               |  |
| DESCRIPTION        | REPORT NO.                   | RESPONSIBLE ORGN.        | CHARGE NUMBER                   | SUMMARY FLAG  |  |
| CHARACTER LOCATION | #B17                         | (6H)                     | (18H)                           | 0 #B35        |  |
| DESCRIPTION        | LEVEL                        | CHARGE NUMBER DESCRIPTOR |                                 |               |  |
| CHARACTER LOCATION | #B35                         | (36H)                    |                                 |               |  |
| DESCRIPTION        | CHG. NO. DESCR. (CONT.)      | CONTRACTOR               | CONTRACT NUMBER                 | NETWORK DESC. |  |
| CHARACTER LOCATION | (4H)                         |                          | (18H)                           | (36H)         |  |
| DESCRIPTION        | NETWORK DESCRIPTOR (CONT.)   |                          | N.H.R.                          |               |  |
| CHARACTER LOCATION |                              |                          | (18H)                           |               |  |
| DESCRIPTION        | NEXT HIGHER RELATION (CONT.) |                          | NEXT HIGHER RELATION DESCRIPTOR |               |  |
| CHARACTER LOCATION |                              |                          | (36H)                           |               |  |

Fig. III-1-29. Tape Format of Reports 80 and 85, Summary

| PROGRAM NUMBER | PERT COST |
|----------------|-----------|
| 1              | 1         |
| 2              | 2         |
| 3              | 3         |
| 4              | 4         |
| 5              | 5         |
| 6              | 6         |
| 7              | 7         |
| 8              | 8         |
| 9              | 9         |
| 10             | 10        |
| 11             | 11        |
| 12             | 12        |
| 13             | 13        |
| 14             | 14        |
| 15             | 15        |
| 16             | 16        |
| 17             | 17        |
| 18             | 18        |
| 19             | 19        |
| 20             | 20        |
| 21             | 21        |
| 22             | 22        |
| 23             | 23        |
| 24             | 24        |
| 25             | 25        |
| 26             | 26        |
| 27             | 27        |
| 28             | 28        |
| 29             | 29        |
| 30             | 30        |
| 31             | 31        |
| 32             | 32        |
| 33             | 33        |
| 34             | 34        |
| 35             | 35        |
| 36             | 36        |
| 37             | 37        |
| 38             | 38        |
| 39             | 39        |
| 40             | 40        |
| 41             | 41        |
| 42             | 42        |
| 43             | 43        |
| 44             | 44        |
| 45             | 45        |
| 46             | 46        |
| 47             | 47        |
| 48             | 48        |
| 49             | 49        |
| 50             | 50        |
| 51             | 51        |
| 52             | 52        |
| 53             | 53        |
| 54             | 54        |
| 55             | 55        |
| 56             | 56        |
| 57             | 57        |
| 58             | 58        |
| 59             | 59        |
| 60             | 60        |
| 61             | 61        |
| 62             | 62        |
| 63             | 63        |
| 64             | 64        |
| 65             | 65        |
| 66             | 66        |
| 67             | 67        |
| 68             | 68        |
| 69             | 69        |
| 70             | 70        |
| 71             | 71        |
| 72             | 72        |
| 73             | 73        |
| 74             | 74        |
| 75             | 75        |
| 76             | 76        |
| 77             | 77        |
| 78             | 78        |
| 79             | 79        |
| 80             | 80        |
| 81             | 81        |
| 82             | 82        |
| 83             | 83        |
| 84             | 84        |
| 85             | 85        |
| 86             | 86        |
| 87             | 87        |
| 88             | 88        |
| 89             | 89        |
| 90             | 90        |
| 91             | 91        |
| 92             | 92        |
| 93             | 93        |
| 94             | 94        |
| 95             | 95        |
| 96             | 96        |
| 97             | 97        |
| 98             | 98        |
| 99             | 99        |
| 100            | 100       |

NAME OF RECORD REPORT 80 &amp; 85 (SUMMARY) (CONT.)

|                    | 31                    | 32 | 33          | 34                       | 35                       | 36                         |
|--------------------|-----------------------|----|-------------|--------------------------|--------------------------|----------------------------|
| DESCRIPTION        | N.M.R. DESCR. (CONT.) |    | NETWORK NO. | CHARGE NO.<br>START DATE | CHARGE NO.<br>COMPL DATE | WORK PACKAGE<br>START DATE |
| CHARACTER LOCATION |                       |    | (6H)        | D D M M Y Y              | D D M M Y Y              | D D M M Y Y                |

|                    | 37                          | 38                   | 39 | 40                 | 41 | 42     |
|--------------------|-----------------------------|----------------------|----|--------------------|----|--------|
| DESCRIPTION        | WORK PACKAGE<br>COMPL. DATE | PREDECESSOR<br>EVENT |    | SUCCESSOR<br>EVENT |    | C.T.I. |
| CHARACTER LOCATION | D D M M Y Y                 | (9H)                 |    | (9H)               |    | (18H)  |

|                    | 43                          | 44 |
|--------------------|-----------------------------|----|
| DESCRIPTION        | CHRISTMAS TREE IND. (CONT.) |    |
| CHARACTER LOCATION |                             |    |

|                    | WORD |
|--------------------|------|
| DESCRIPTION        |      |
| CHARACTER LOCATION |      |

|                    | WORD |
|--------------------|------|
| DESCRIPTION        |      |
| CHARACTER LOCATION |      |

|                    | WORD |
|--------------------|------|
| DESCRIPTION        |      |
| CHARACTER LOCATION |      |

**Fig. III-1-29. Tape Format of Reports 80 and 85, Summary (Continued)**

# RECORD FORMAT

PROGRAM NUMBER PERT COST PAGE 1

NAME OF RECORD REPORT 80 & 85 (DATA)

|                    | WORD 1           | WORD 2            | WORD 3    | WORD 4        | WORD 5     | WORD 6              |
|--------------------|------------------|-------------------|-----------|---------------|------------|---------------------|
| DESCRIPTION        | REPORT NO.       | RESPONSIBLE ORGN. |           | CHARGE NUMBER |            | SUMMARY FLAG        |
| CHARACTER LOCATION | 0817             | (6H)              |           | (18H)         |            | 1 0835              |
|                    | WORD 7           | WORD 8            | WORD 9    | WORD 10       | WORD 11    | WORD N              |
| DESCRIPTION        | PERFORMING ORGN. | RESOURCE CODE     | COST TYPE | COUNT         | TOTAL COST | COST ITEMS BY MONTH |
| CHARACTER LOCATION | (6H)             | (4H)              | (3H)      | 0835          | 0835       |                     |
| DESCRIPTION        |                  |                   |           |               |            |                     |
| CHARACTER LOCATION |                  |                   |           |               |            |                     |
| DESCRIPTION        |                  |                   |           |               |            |                     |
| CHARACTER LOCATION |                  |                   |           |               |            |                     |
| DESCRIPTION        |                  |                   |           |               |            |                     |
| CHARACTER LOCATION |                  |                   |           |               |            |                     |

Fig III-I-30. Tape Format of Reports 80 and 85, Data

Region KS00

EXPLANATION OF REGION:

To cumulate budget by fiscal year.

CALLING SEQUENCE:

L TSX KS00, 4  
L+1 PZE N  
L+2 Normal return

INPUT:

XR1 = Location of PERT Cost data record (complemented).

OUTPUT:

|       |                |                     |                |
|-------|----------------|---------------------|----------------|
| KS900 | = Prior FY's   | KS900+8             | = Current FY+6 |
| +1    | = Current FY   | +9                  | = To complete  |
| +2    | = Current FY+1 | +10                 | = Total        |
| +3    | = Current FY+2 | KS910               | = C. C. Code   |
| +4    | = Current FY+3 | KS901 thru KS901+11 | = Months of    |
| +6    | = Current FY+4 |                     | current FY     |
| +7    | = Current FY+5 |                     |                |

STORAGE USED:

KBUF3 - 1000 words

SUBREGIONS AND SUBROUTINES USED:

UPCK                      FIXPT

EXPLANATION OF CALLING SEQUENCE:

If N = 1, cumulate hours or units.  
      = 2, cumulate direct dollars.  
      = 3, cumulate total dollars.

Region KS00

EXPLANATION OF REGION:

To cumulate budget by fiscal year.

CALLING SEQUENCE:

L TSX KS00, 4  
L+1 PZE N  
L+2 Normal return

INPUT:

XR1 = Location of PERT Cost data record (complemented).

OUTPUT:

|       |                |                     |                |
|-------|----------------|---------------------|----------------|
| KS900 | = Prior FY's   | KS900+8             | = Current FY+6 |
| +1    | = Current FY   | +9                  | = To complete  |
| +2    | = Current FY+1 | +10                 | = Total        |
| +3    | = Current FY+2 | KS910               | = C. C. Code   |
| +4    | = Current FY+3 | KS901 thru KS901+11 | = Months of    |
| +6    | = Current FY+4 | current FY          |                |
| +7    | = Current FY+5 |                     |                |

STORAGE USED:

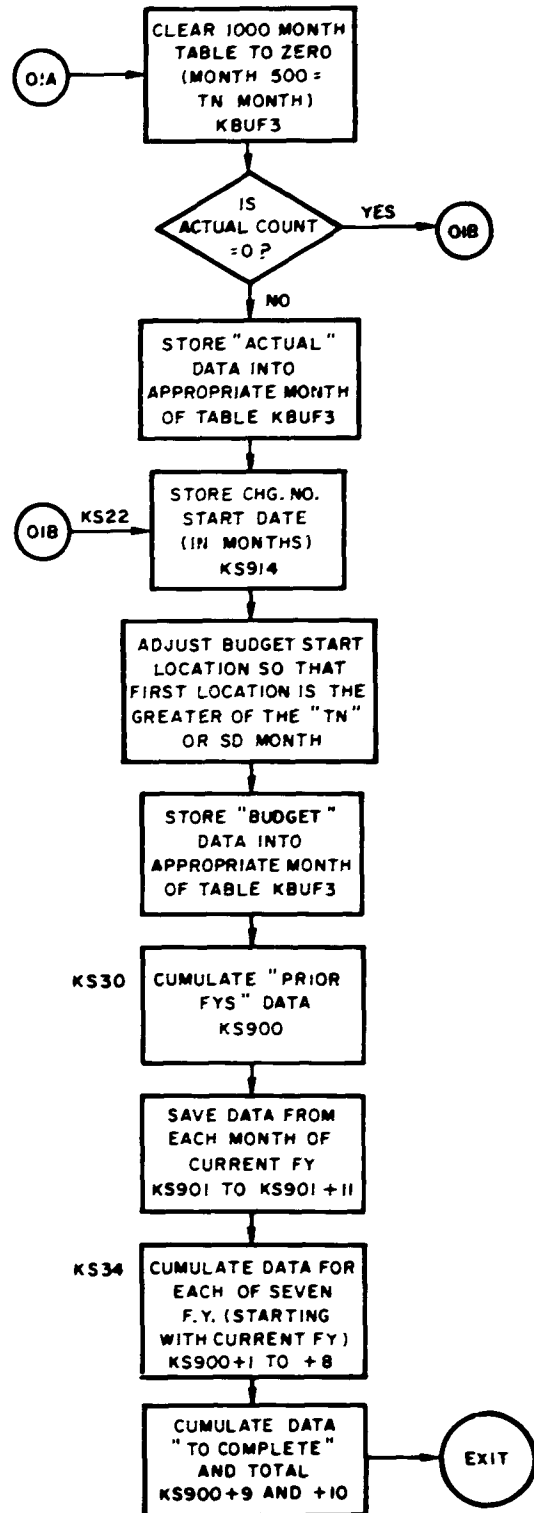
KBUF3 - 1000 words

SUBREGIONS AND SUBROUTINES USED:

UPCK                      FIXPT

EXPLANATION OF CALLING SEQUENCE:

If N = 1, cumulate hours or units.  
      = 2, cumulate direct dollars.  
      = 3, cumulate total dollars.



Region KX00

EXPLANATION OF REGION:

To locate actuals, budgets, and estimates for an individual month.

CALLING SEQUENCE:

L     TSX   KX00, 4

L+1   Normal return

INPUT:

XRI = Location of PERT Cost data record (complemented).

OUTPUT:

KX902 = date

KX905 = estimate

KX903 = actual

KX906 = overrun/underrun

KX904 = budget

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

FIXPT

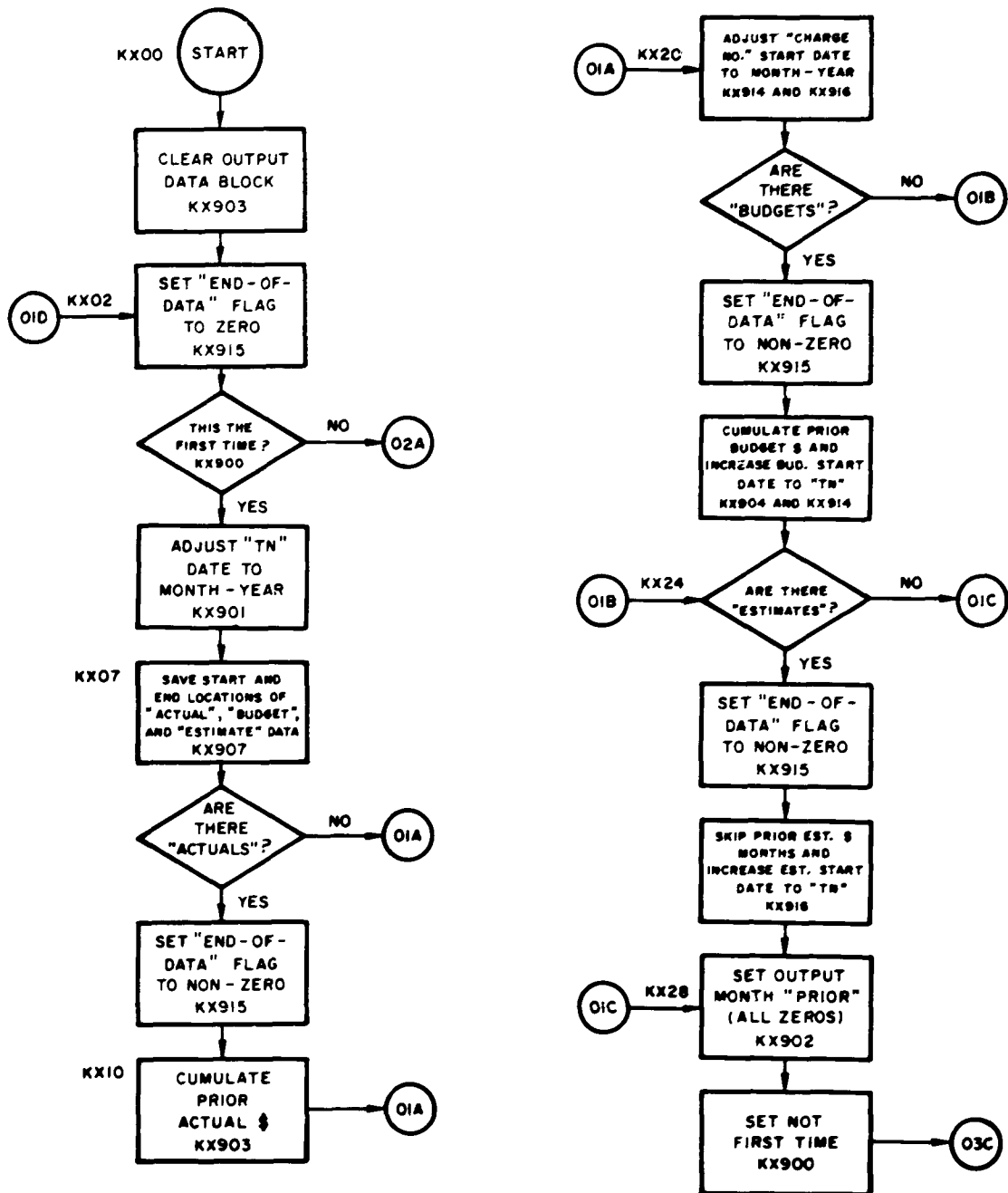
UPCK

PACK

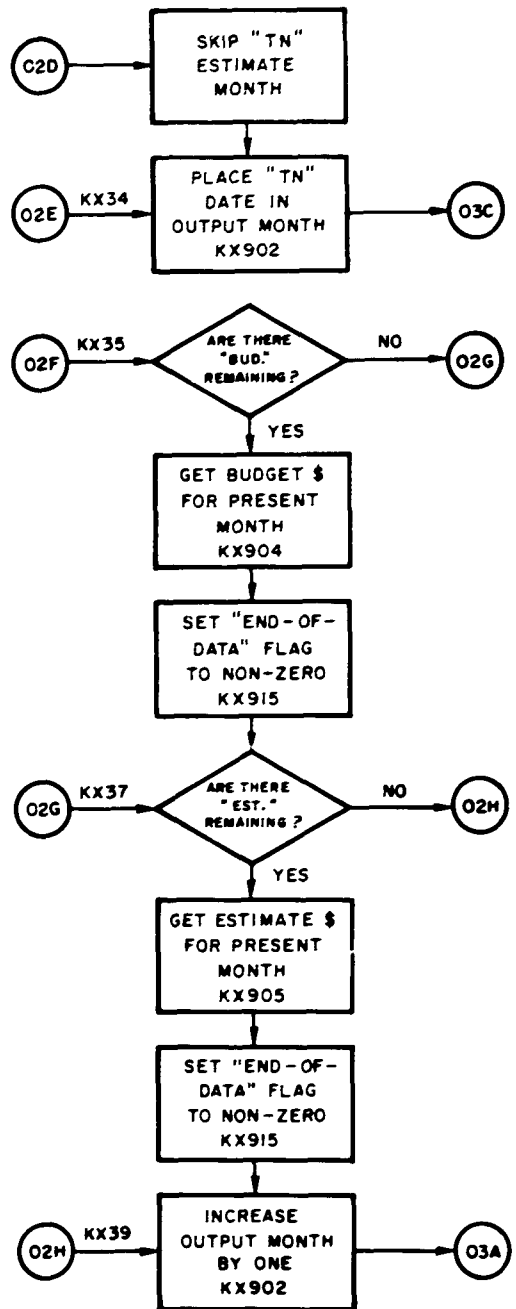
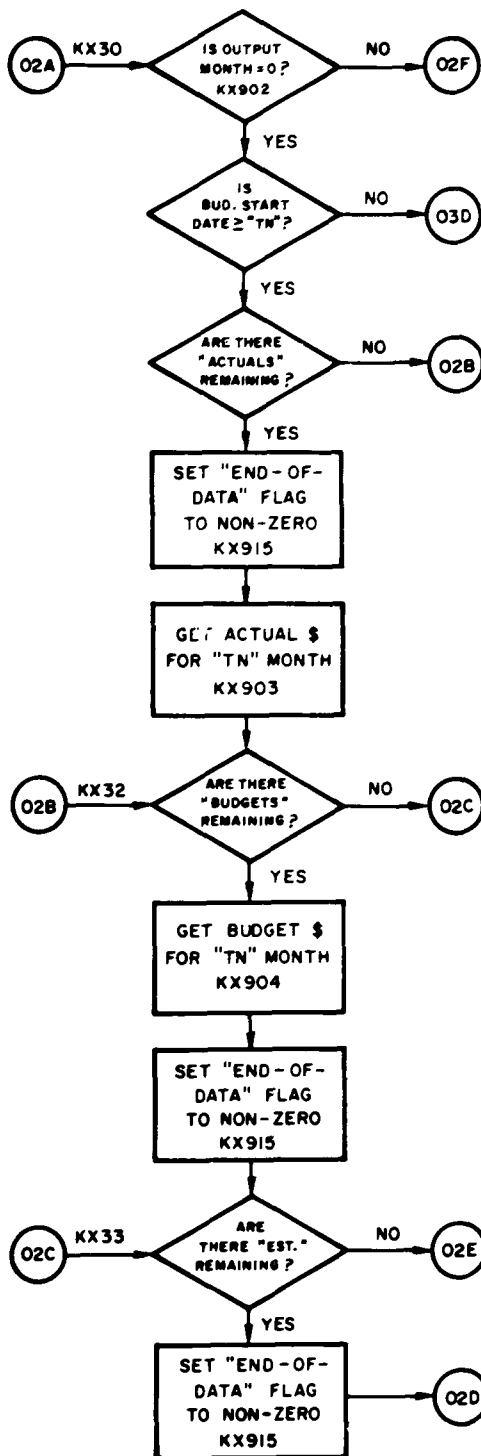
EXPLANATION OF CALLING SEQUENCE:

Not applicable.

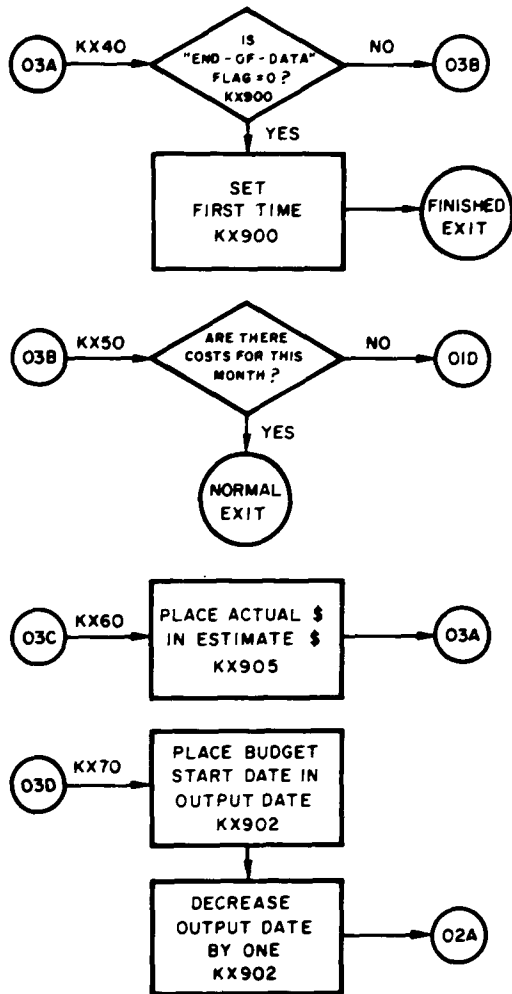
REGION KX00







REGION KX00



### III-J FINAL REPORTING PHASE

In the final reporting phase the reports are generated from the cost and time information and set onto the Output Print tape.

#### Input

The tapes from the XSORT sorting routine (prior to the final merge pass) will be used as input into this phase. These tapes will contain all the information necessary for producing the requested reports and will be sequenced by report number major and report level minor. Each report will contain all the information necessary for producing that individual report.

#### Procedure

Each report is operated upon separately and in report number order. The bulk of the computations necessary to produce a given report is done at this time. These computations may involve cumulating cost data or summarizing time data up the work breakdown structure, calculating "value" or "percent overrun/underrun," or totaling cost information for an individual cost category. After the computations are completed, it is sometimes necessary to perform an additional sort in order to put the data into the sequence required by the report. The data is then put into the specified report format and placed on the output report tape.

#### List of Reports Produced

| <u>Report No.</u> | <u>Level Report ?</u> | <u>Report Title</u>        | <u>Sort Sequence</u>                            |
|-------------------|-----------------------|----------------------------|-------------------------------------------------|
| 10                | yes                   | Organization Status Report | Perf. Orgn., Charge No., Resp. Orgn., Res. Code |
| 11                | yes                   | Organization Status Report | Res. Code, Charge No., Resp. Orgn., Perf. Orgn. |

List of Reports Produced (Continued)

| <u>Report<br/>No.</u> | <u>Level<br/>Report ?</u> | <u>Report<br/>Title</u>             | <u>Sort<br/>Sequence</u>                                       |
|-----------------------|---------------------------|-------------------------------------|----------------------------------------------------------------|
| 12                    | yes                       | Organization Status Report          | Charge No., Resp.<br>Orgn., Perf. Orgn.,<br>Res. Code          |
| 13                    | yes                       | Organization Status Report          | Resp. Orgn., Charge<br>No., Perf. Orgn.,<br>Res. Code          |
| 20                    | yes                       | Organization Status Report          | Net No., Perf. Orgn.,<br>Charge No., Resp.<br>Orgn., Res. Code |
| 21                    | yes                       | Organization Status Report          | Net No., Res. Code<br>Charge No., Resp.<br>Orgn., Perf. Orgn.  |
| 22                    | yes                       | Organization Status Report          | Net No., Charge No.,<br>Resp. Orgn., Perf.<br>Orgn., Res. Code |
| 23                    | yes                       | Organization Status Report          | Net No., Resp. Orgn.,<br>Charge No., Perf.<br>Orgn., Res. Code |
| 30                    | yes                       | Management Summary Report           |                                                                |
| 35                    | yes                       | Program/Project Status<br>Report    |                                                                |
| 40                    | yes                       | Financial Plan and Status<br>Report | Month, Charge No.                                              |
| 41                    | yes                       | Financial Plan and Status<br>Report | Month                                                          |
| 50                    | yes                       | Manpower Loading Report             | Res. Code, Month,<br>Perf. Orgn., Charge<br>No.                |
| 51                    | yes                       | Manpower Loading Report             | Res. Code, Month                                               |

List of Reports Produced (Continued)

| <u>Report<br/>No.</u> | <u>Level<br/>Report?</u> | <u>Report<br/>Title</u>                   | <u>Sort<br/>Sequence</u>         |
|-----------------------|--------------------------|-------------------------------------------|----------------------------------|
| 52                    | yes                      | Manpower Loading Report                   | Perf. Orgn., Month,<br>Res. Code |
| 55                    | yes                      | Rainbow Category Report                   |                                  |
| 60                    | yes                      | Cost Category Status Report               |                                  |
| 70                    | yes                      | Summary Financial Forecast                | Summary, Year                    |
| 71                    | yes                      | Summary Financial Forecast                | Cost Cat., Year                  |
| 75                    | yes                      | Summary Financial Forecast                | Summary, Month                   |
| 76                    | yes                      | Summary Financial Forecast                | Cost Cat., Month                 |
| 80                    | no                       | Budget Authorization and<br>Updating Form |                                  |
| 85                    | no                       | Cost Estimating and<br>Updating Form      |                                  |

Final Reporting Phase Region Descriptions

The major subroutines in this phase are described below. A flow diagram of the master control region for this phase is given as Fig III-J-1.

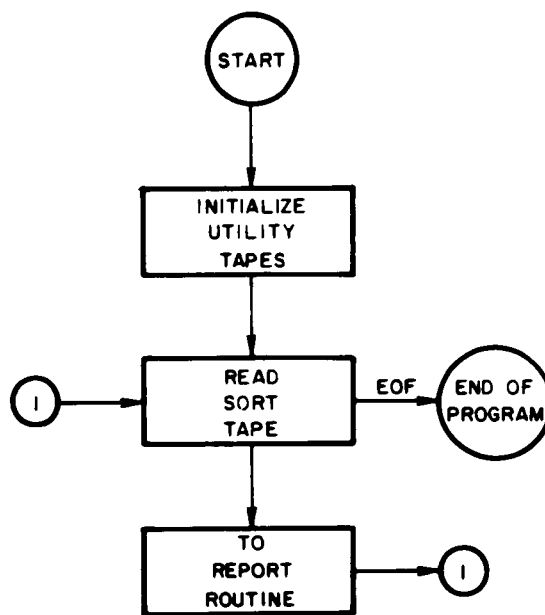


Fig III-J-1. Flow Diagram of Final Report Phase

Region LA00

EXPLANATION OF REGION:

Master control region for final reporting phase. Initializes tapes and communicates with report routines.

CALLING SEQUENCE:

L TRA LA00

INPUT:

Sorted tape from XSORT routine.

OUTPUT:

Report tape for printing.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

YREAD

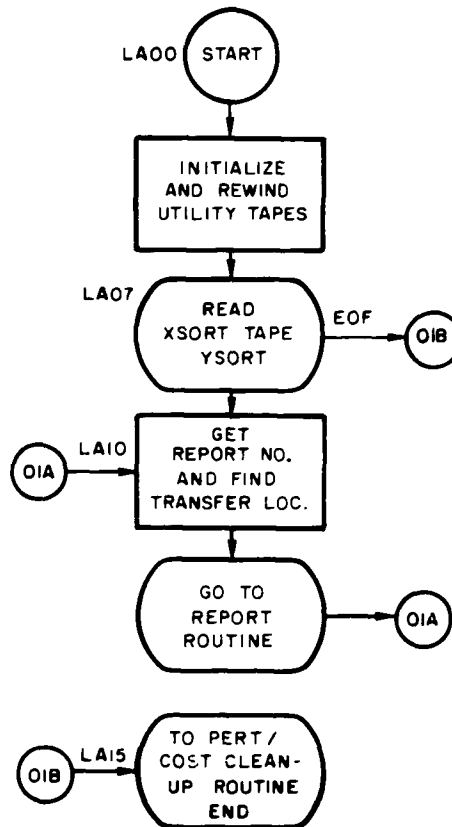
Report regions

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION LA00

---





Region LA100

EXPLANATION OF REGION:

To print bottom titles (security number and page number).

CALLING SEQUENCE:

L    TSX    LA100, 4

L+1   Normal return

INPUT:

ZSEC   - security number

ZPAGE   - page number

OUTPUT:

Bottom title printed on line 59.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

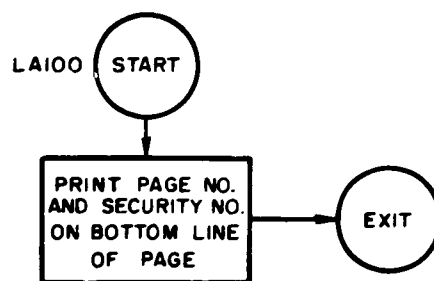
Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION LA100

---



### Region LB00

#### EXPLANATION OF REGION:

To cumulate a major and subtotal for the first two items in the sort, and print out the "Organization Status Report."

#### CALLING SEQUENCE:

L     TSX    LB00, 4  
L+1  PZE    0, 0, R  
L+2  PZE    H  
L+3  PZE    T2,, T1  
L+4  PZE    S1,, S2  
L+5  PZE    S3,, S4  
L+6  Normal return

#### INPUT:

Information from XSORT routine.

#### OUTPUT:

Report on output print tape.

#### STORAGE USED:

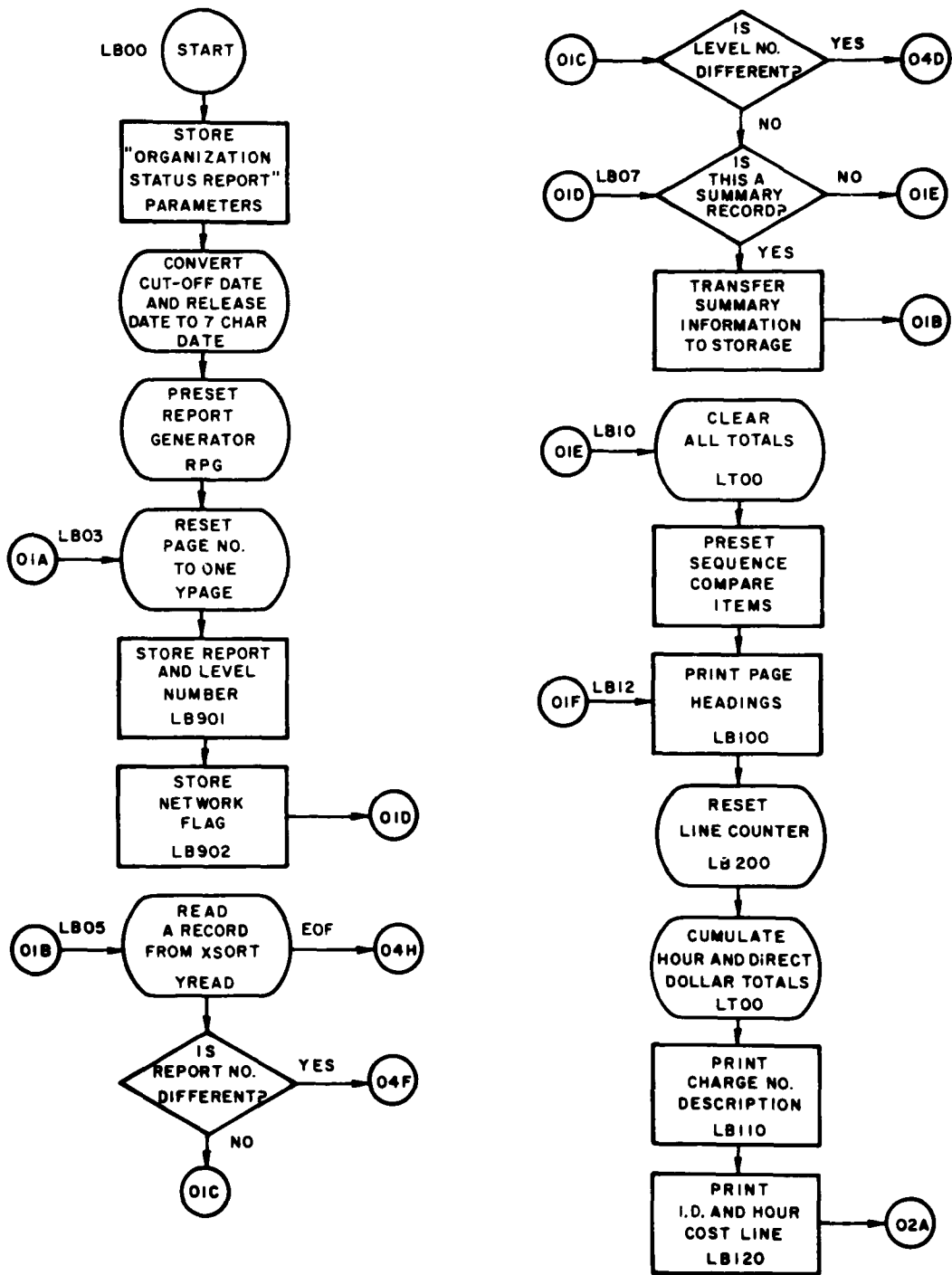
Not applicable.

#### SUBREGIONS AND SUBROUTINES USED:

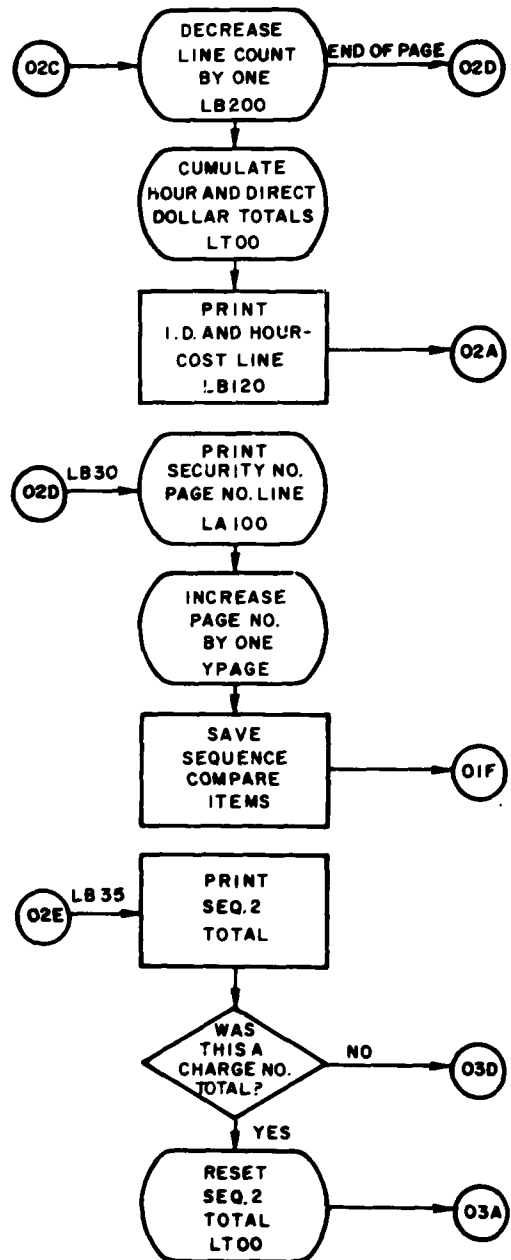
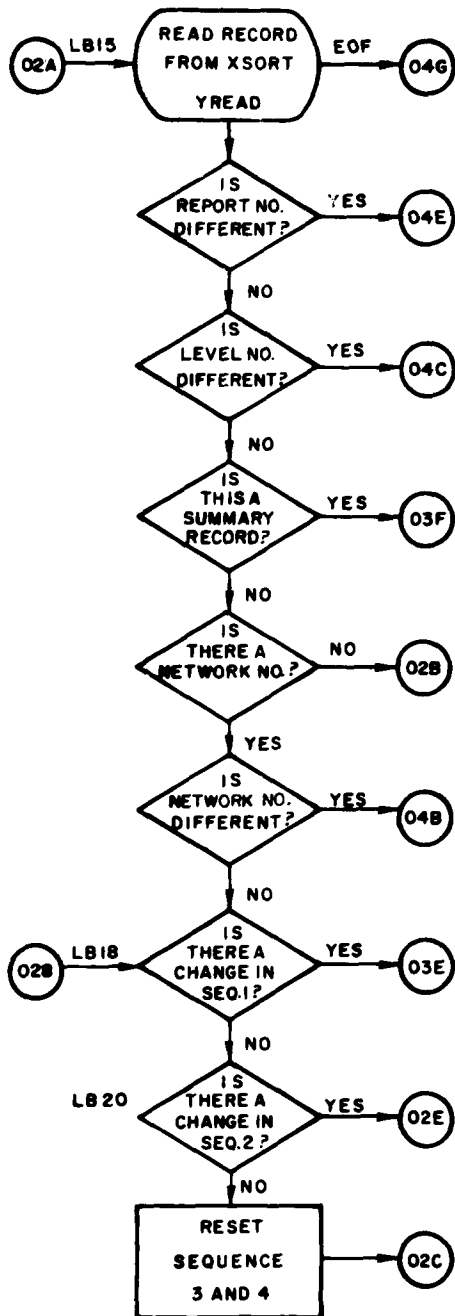
YPAGE       YREAD       LB200  
LT00        LA100       YSEC  
YCOMP

#### EXPLANATION OF CALLING SEQUENCE:

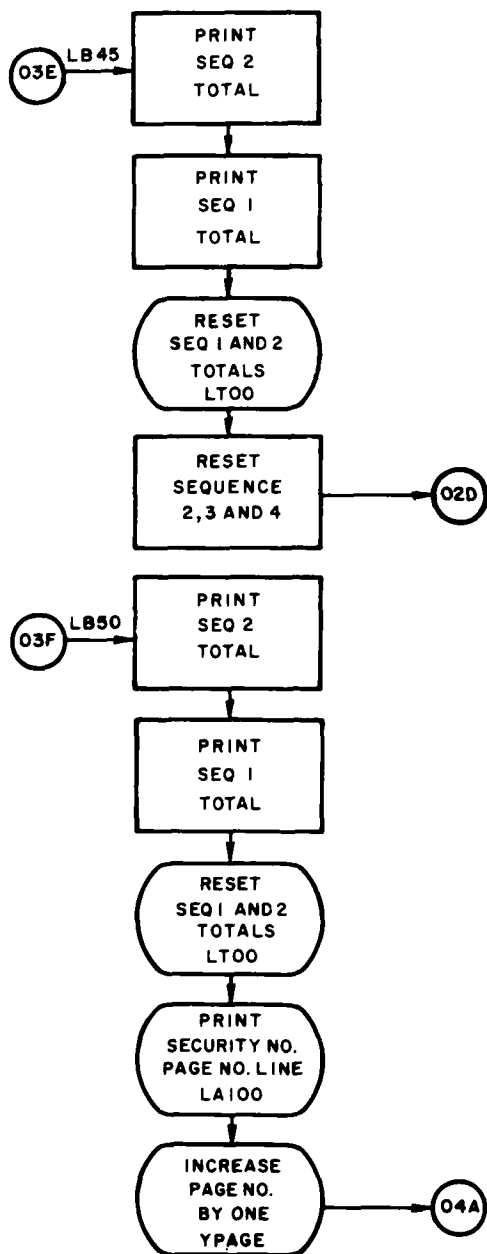
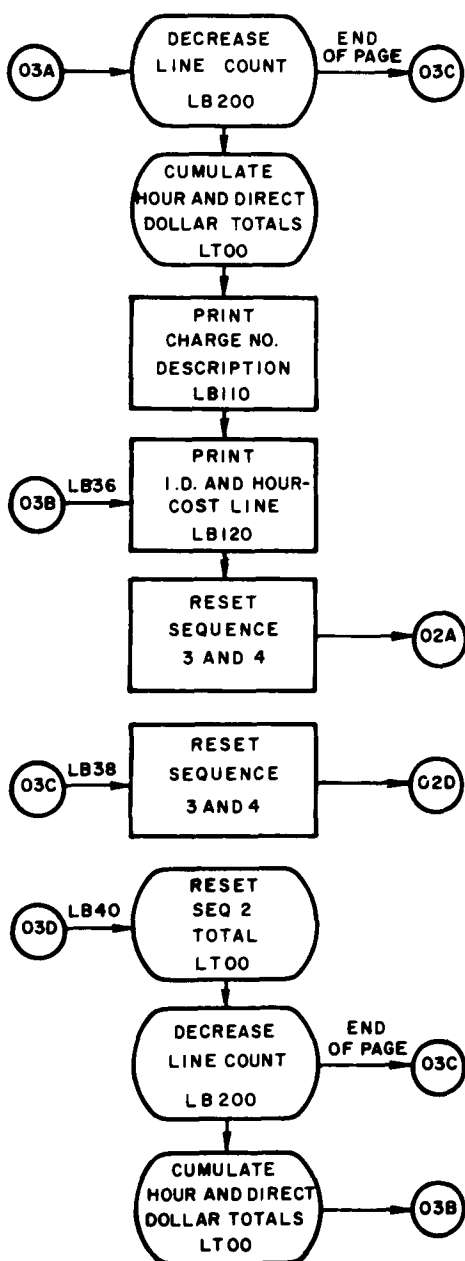
|                                             |                                                 |
|---------------------------------------------|-------------------------------------------------|
| R = report no.                              | S1 through S4 = sort sequence of report, where: |
| H = location of sort sequence print routine | 1 = charge no.                                  |
| T1 = location of major total print routine  | 2 = responsible orgn.                           |
| T2 = location of subtotal print routine     | 3 = performing orgn.                            |
|                                             | 4 = resource code                               |



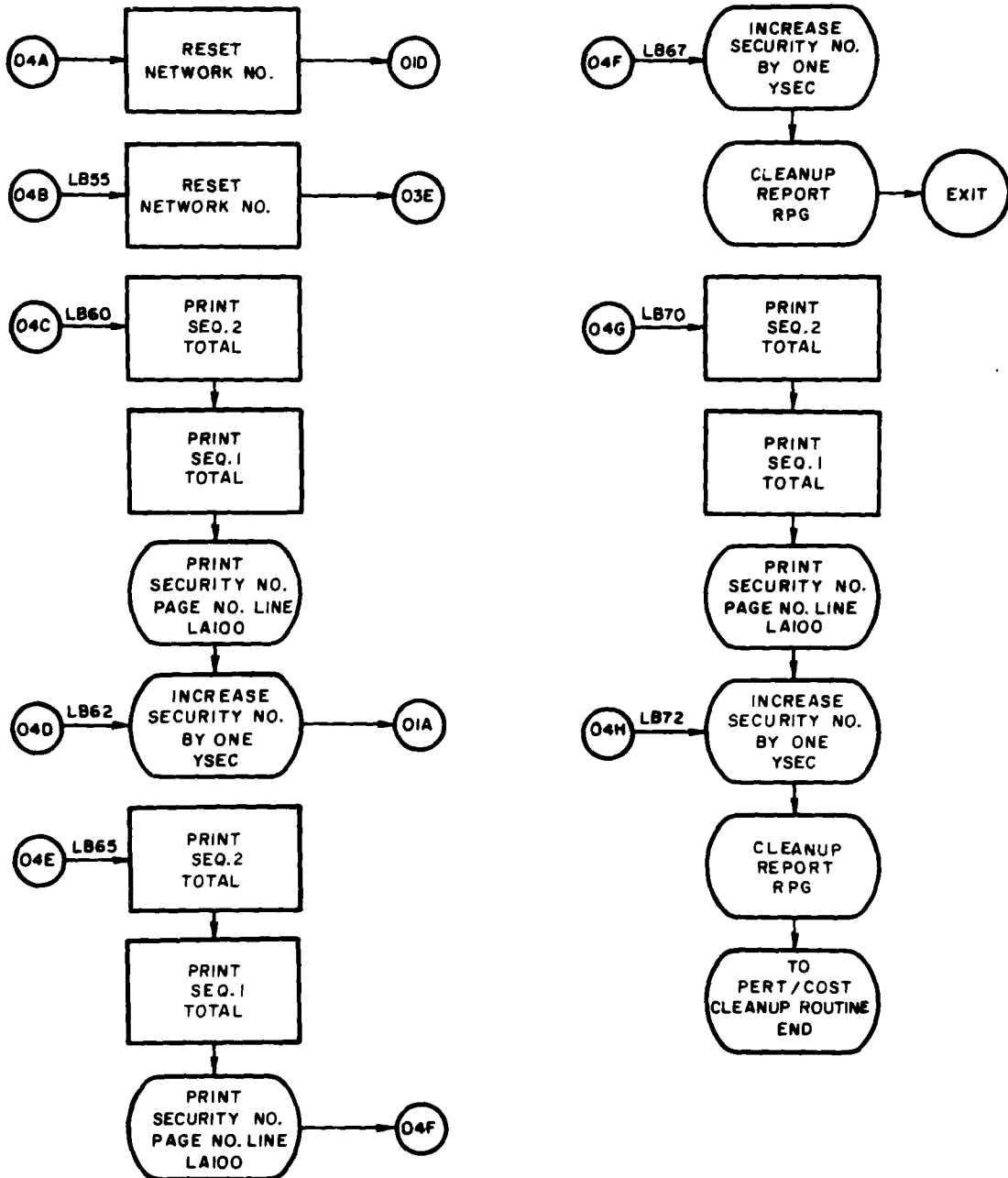
REGION LB00



REGION LB00



REGION LB00



Region LB200

EXPLANATION OF REGION:

To control page spacing and give end-of-page indication.

CALLING SEQUENCE:

L     TSX    LB200, 4  
L+1   PZE    A  
L+2   End-of-page return  
L+3   Normal return

INPUT:

Not applicable.

OUTPUT:

Not applicable.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

If  $A = 0$ , line counter is set to total lines available,

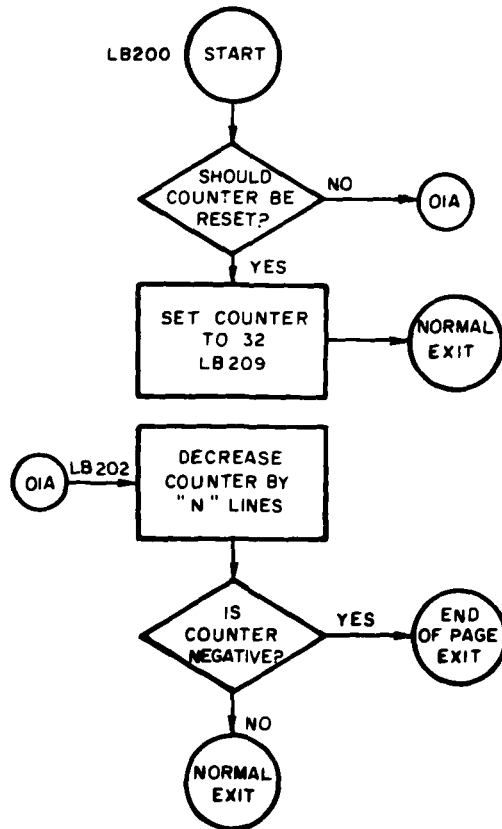
If  $A = N$  (where  $N$  is non-zero) the line counter is decreased by  $N$ .

When the line counter is negative, the routine will exit at end of page.



REGION LB200

---



Region LC10

EXPLANATION OF REGION:

Setup region for printing Report 10.

CALLING SEQUENCE:

L TSX LC10, 4

L+1 Normal return

INPUT:

Report 10 information from XSORT.

OUTPUT:

Report 10 on output report tape.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

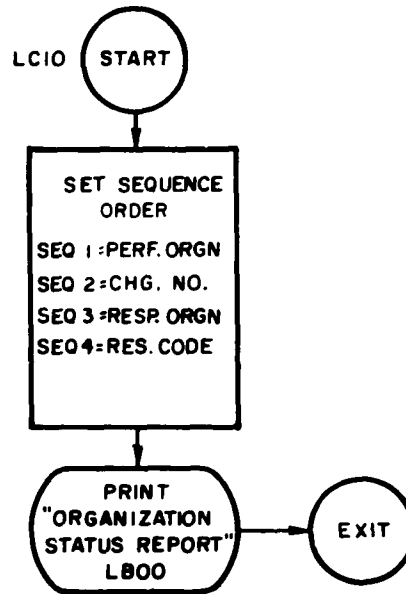
LB00

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION LCIO

---



Region LC11

EXPLANATION OF REGION:

Setup region for printing Report 11.

CALLING SEQUENCE:

L TSX LC11, 4

L+1 Normal return

INPUT:

Report 11 information from XSORT.

OUTPUT:

Report 11 on output report tape.

STORAGE USED:

Not Applicable.

SUBREGIONS AND SUBROUTINES USED:

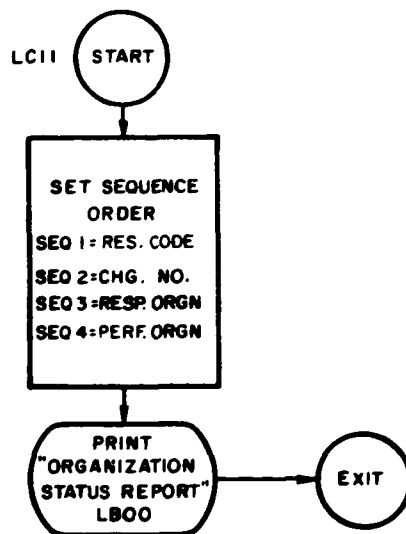
LB00

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION LCII

---



Region LC12

EXPLANATION OF REGION:

Setup region for printing Report 12.

CALLING SEQUENCE:

L TSX LC12, 4

L+1 Normal return

INPUT:

Report 12 information from XSORT.

OUTPUT:

Report 12 on output report tape.

STORAGE USED:

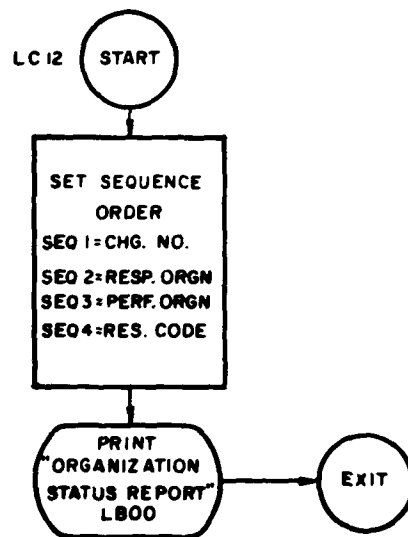
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

LB00

EXPLANATION OF CALLING SEQUENCE:

Not applicable.



Region LC13

EXPLANATION OF REGION:

Setup region for printing Report 13.

CALLING SEQUENCE:

L     TSX    LC13, 4

L+1   Normal return

INPUT:

Report 13 information from XSORT.

OUTPUT:

Report 13 on output report tape.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

LB00

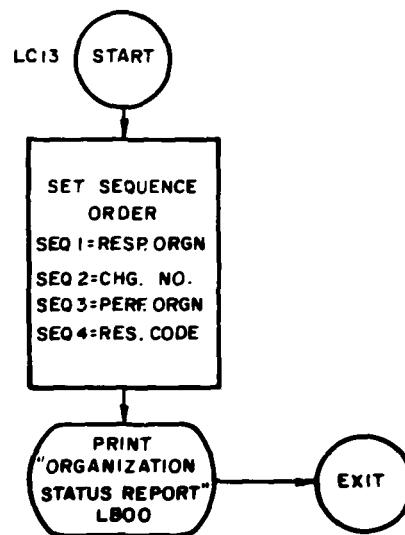
EXPLANATION OF CALLING SEQUENCE:

Not applicable.



REGION LC13

---



Region LC20

EXPLANATION OF REGION:

Setup region for printing Report 20.

CALLING SEQUENCE:

L TSX LC20, 4

L+1 Normal return

INPUT:

Report 20 information from XSORT.

OUTPUT:

Report 20 on output report tape.

STORAGE USED:

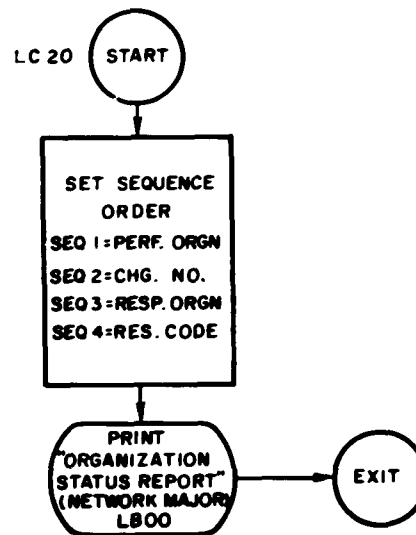
Not applicable.

SUBREGIONS AND SUBROUTINES USED:

LB00

EXPLANATION OF CALLING SEQUENCE:

Not applicable.



Region LC21

EXPLANATION OF REGION:

Setup region for printing report 21.

CALLING SEQUENCE:

L TSX LC21, 4

L+1 Normal return

INPUT:

Report 21 information from XSORT.

OUTPUT:

Report 21 on output report tape.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

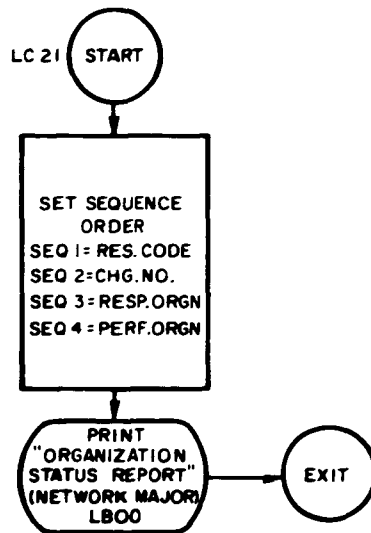
LB00

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION LC 21

---



Region LC22

EXPLANATION OF REGION:

Setup region for printing Report 22.

CALLING SEQUENCE:

L     TSX     LC22, 4

L+1   Normal return

INPUT:

Report 22 information from XSORT.

OUTPUT:

Report 22 on output Report tape.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

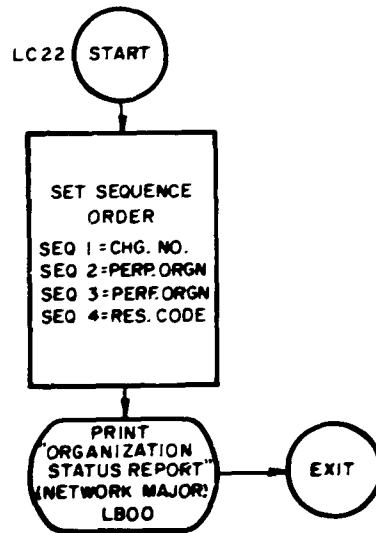
LB00

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION LC22

---



Region LC23

EXPLANATION OF REGION:

Setup region for printing Report 23.

CALLING SEQUENCE:

L TSX LC23, 4

L+1 Normal return

INPUT:

Report 23 information from XSORT.

OUTPUT:

Report 23 on output report tape.

STORAGE USED:

Not applicable.

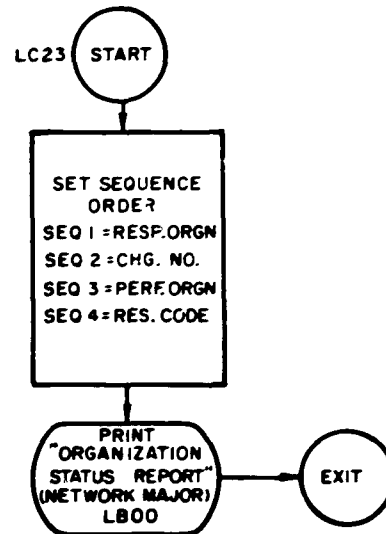
SUBREGIONS AND SUBROUTINES USED:

LB00

EXPLANATION OF CALLING SEQUENCE:

Not applicable.





Region LD00

EXPLANATION OF REGION:

To cumulate cost data and summarize time data up the work breakdown structure and print Report 30 (only items at the requested level and the next lower level connected to the item).

CALLING SEQUENCE:

L     TSX    LD00, 4  
L+1   Normal return

INPUT:

Report 30 information from XSORT.

OUTPUT:

Report 30 on output report tape.

STORAGE USED:

Not applicable.

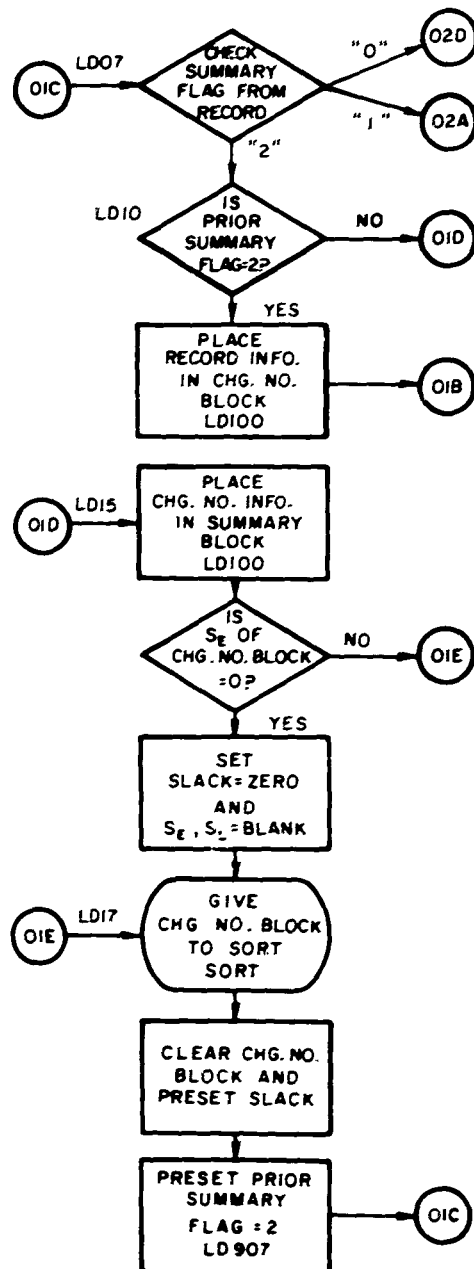
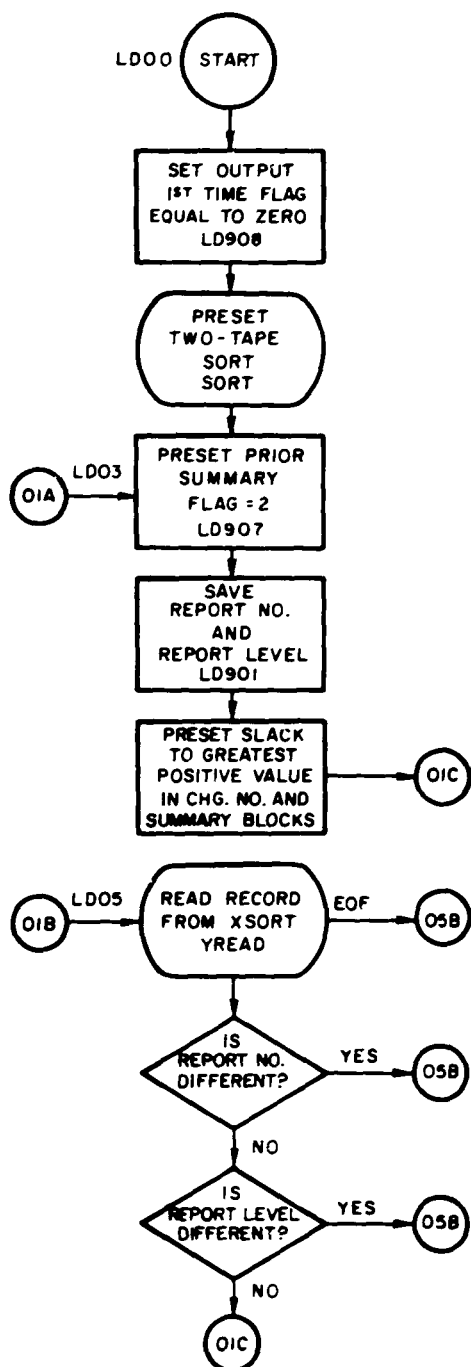
SUBREGIONS AND SUBROUTINES USED:

|      |       |       |
|------|-------|-------|
| SORT | YREAD | YCOMP |
| READ | YPAGE | UPCK  |
| PACK | LA100 | YSEC  |
| LX00 |       |       |

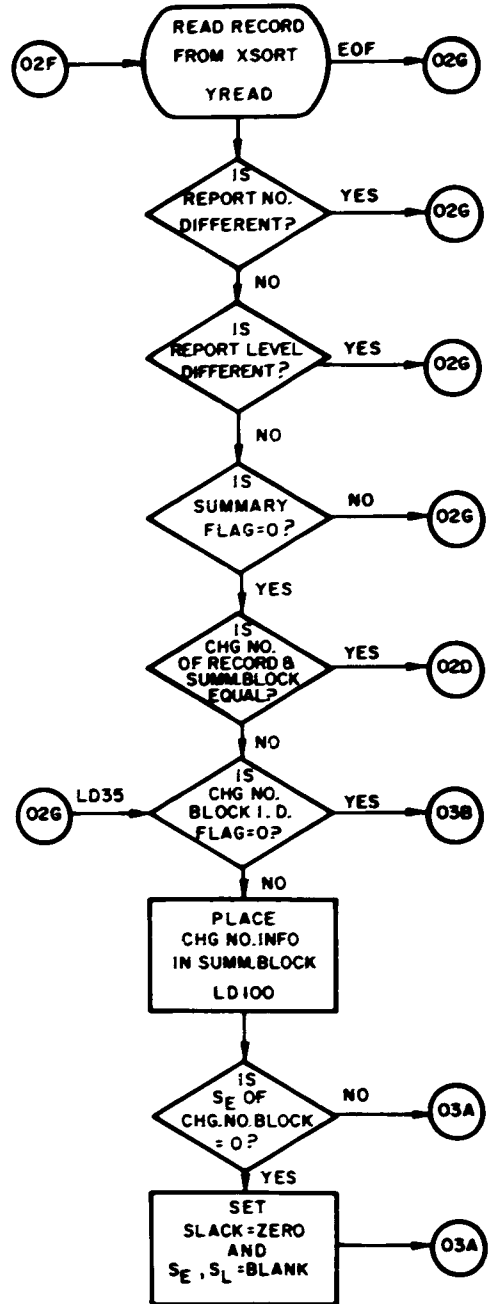
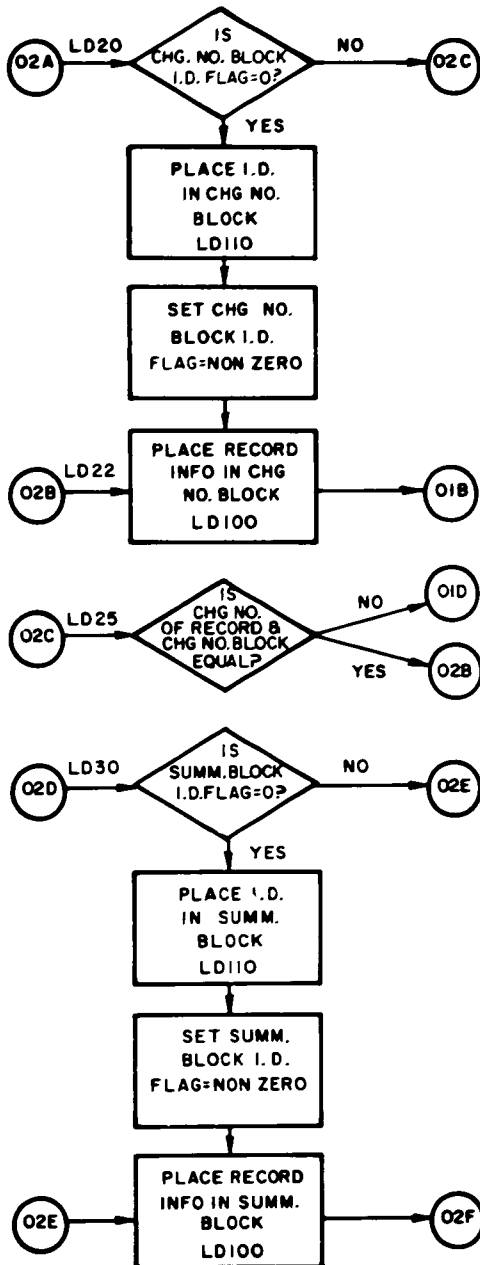
EXPLANATION OF CALLING SEQUENCE:

Not applicable.

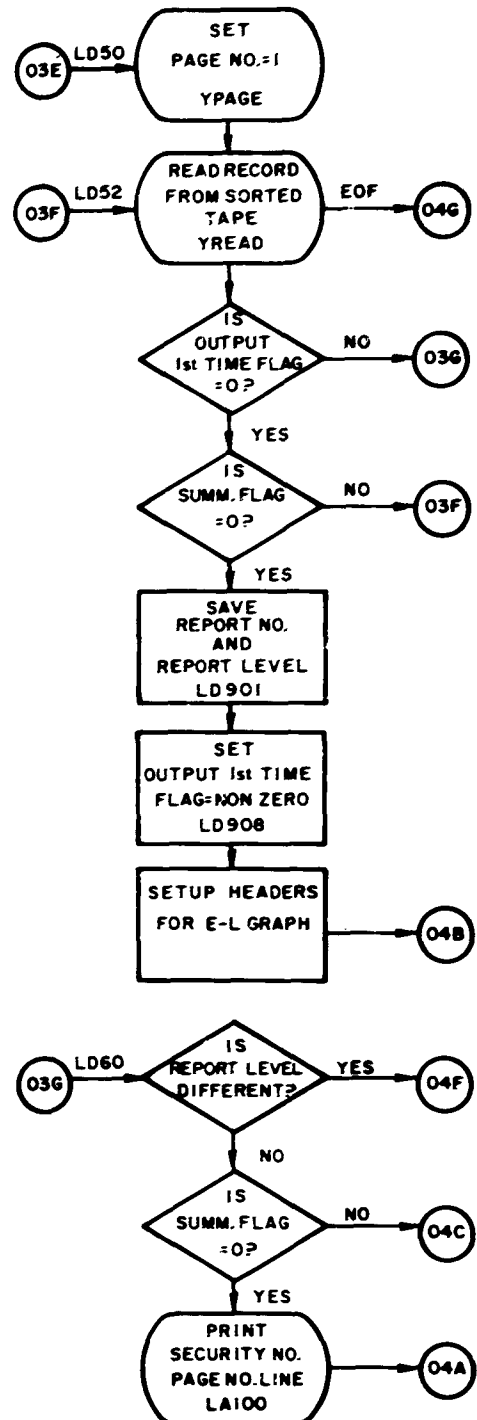
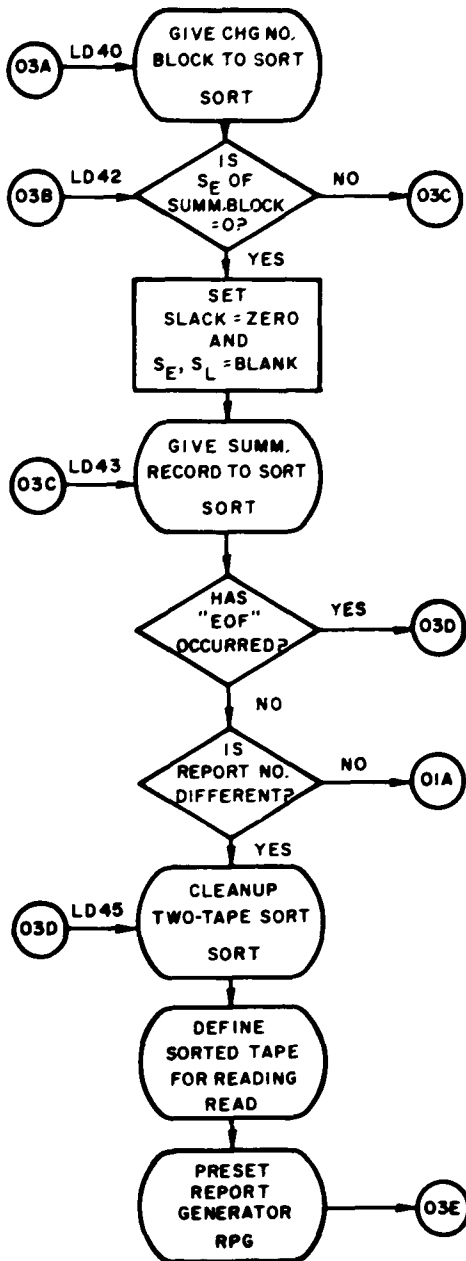
REGION LD00



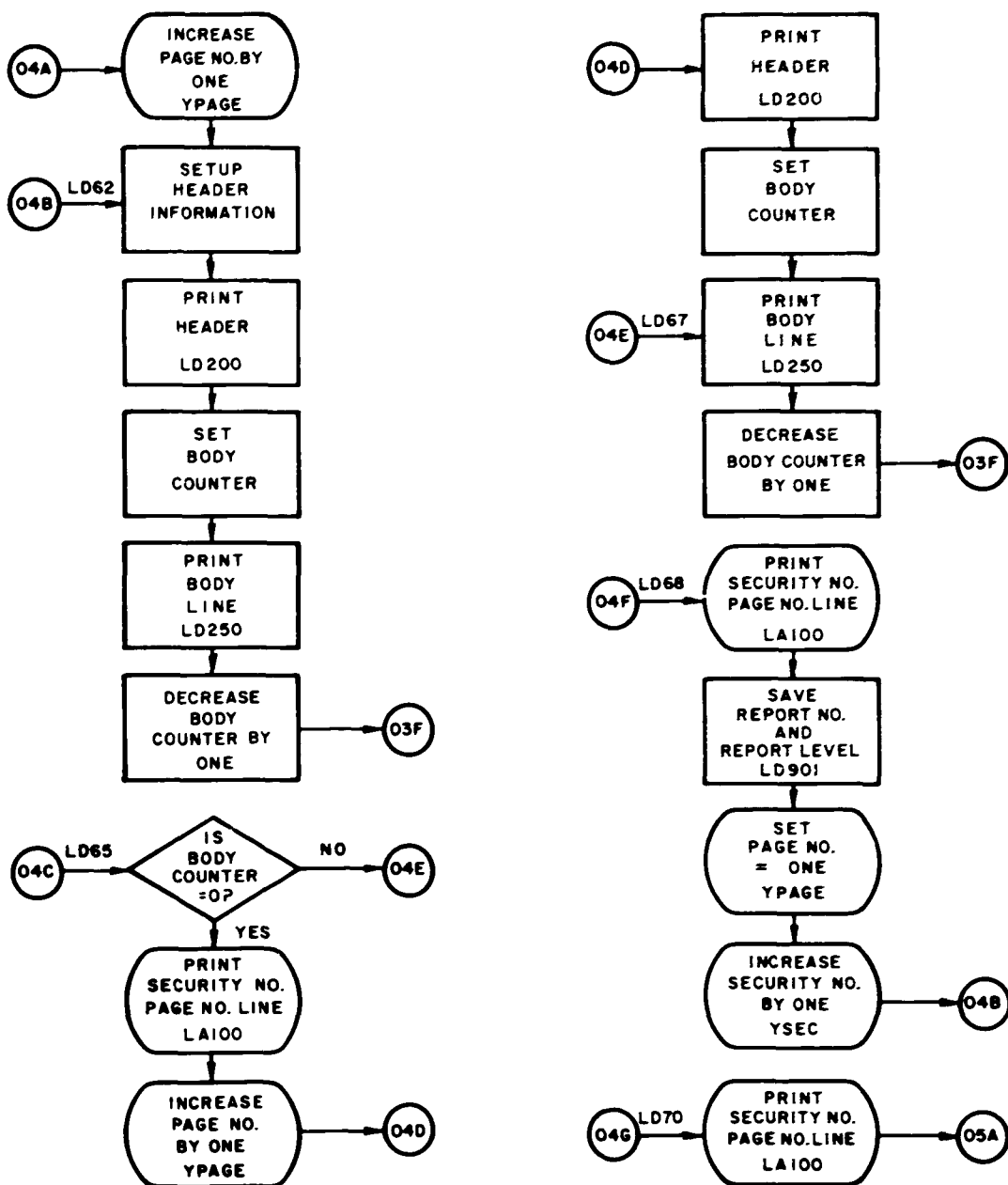
REGION LDOO

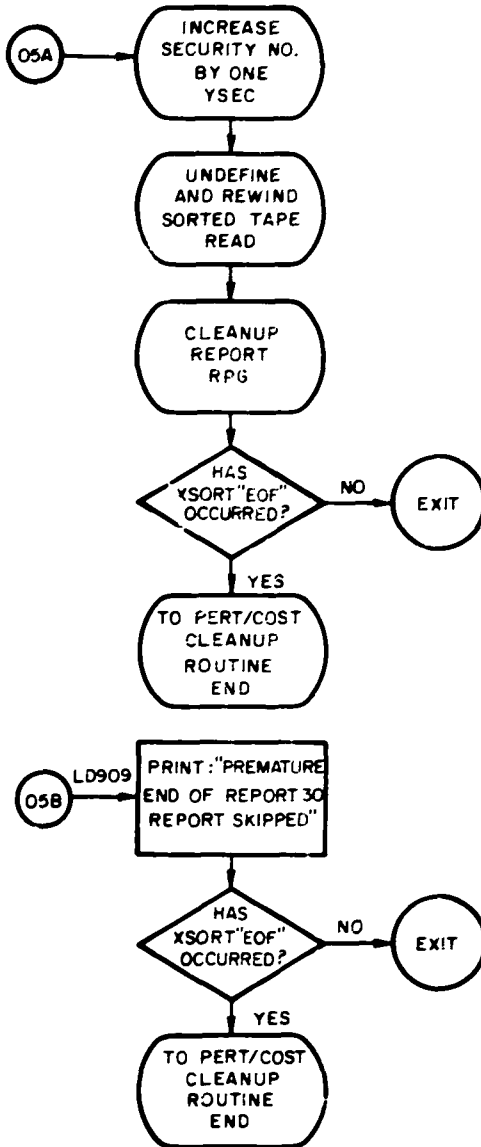


REGION LD00



REGION LD00





Region LE00

EXPLANATION OF REGION:

Setup region for printing Report 40.

CALLING SEQUENCE:

L TSX LE00, 4

L+1 Normal return

INPUT:

Report 40 information from XSORT.

OUTPUT:

Report 40 on output report tape.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

LE10

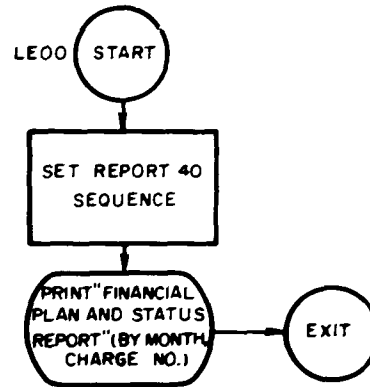
EXPLANATION OF CALLING SEQUENCE:

Not applicable.



REGION LEOO

---



Region LE05

EXPLANATION OF REGION:

Setup region for printing Report 40.

CALLING SEQUENCE:

L TSX LE05, 4

L+1 Normal return

INPUT:

Report 41 information from XSORT.

OUTPUT:

Report 41 on output report tape.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

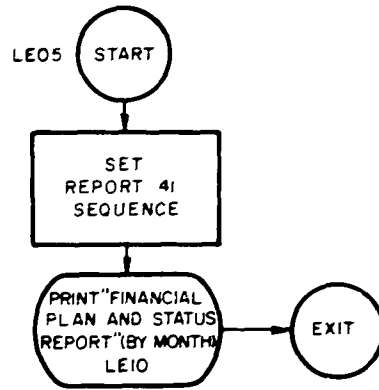
LE10

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION LE05

---



Region LE10

**EXPLANATION OF REGION:**

To cumulate cost information and print out "Financial Plan and Status Report."

**CALLING SEQUENCE:**

L     TSX    LE10, 4  
L+1  PZE    0, 0, R  
L+2  PZE    A,, B  
L+3  Normal return

**INPUT:**

Information from XSORT routine.

**OUTPUT:**

Report on output print tape.

**STORAGE USED:**

Not applicable.

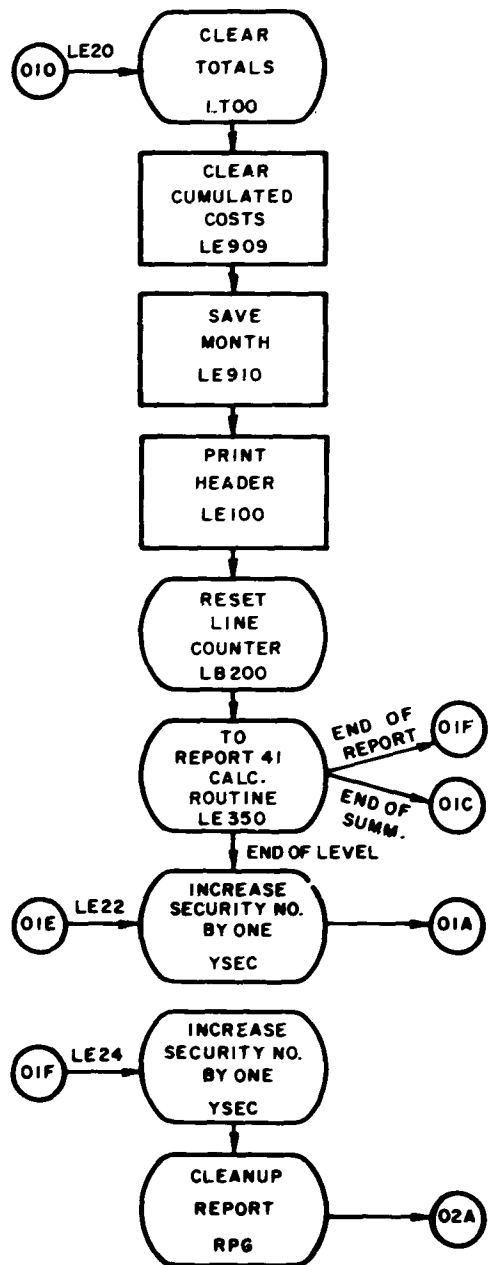
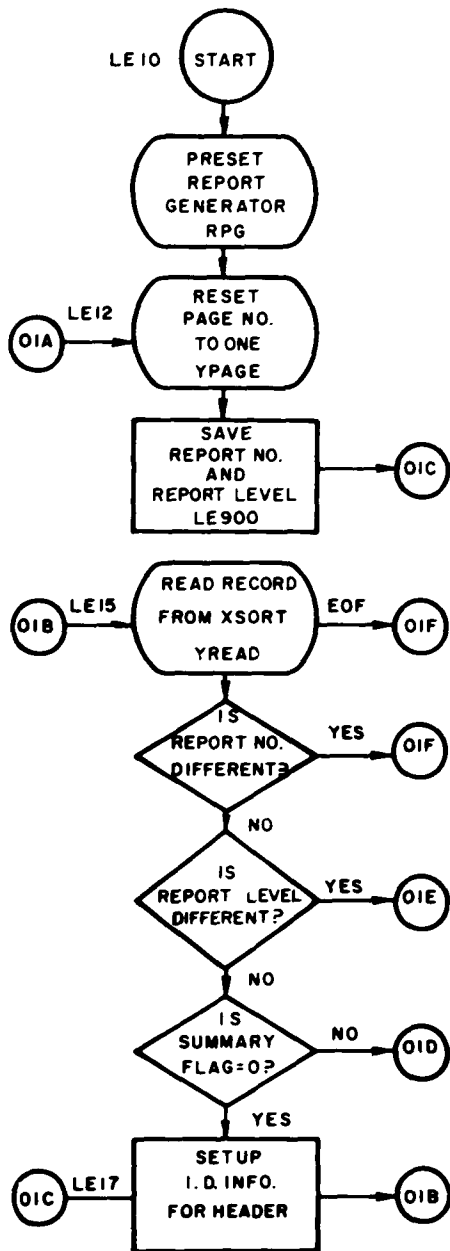
**SUBREGIONS AND SUBROUTINES USED:**

|       |       |       |
|-------|-------|-------|
| YPAGE | YREAD | LT00  |
| LB200 | YSEC  | LX00  |
| DATE  | YCOMP | LA100 |

**EXPLANATION OF CALLING SEQUENCE:**

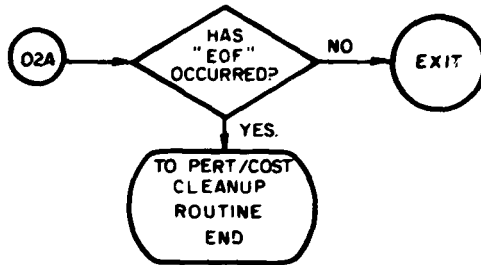
R = report number  
A = location of calculation  
B = location of sort sequence title

# REGION LE10

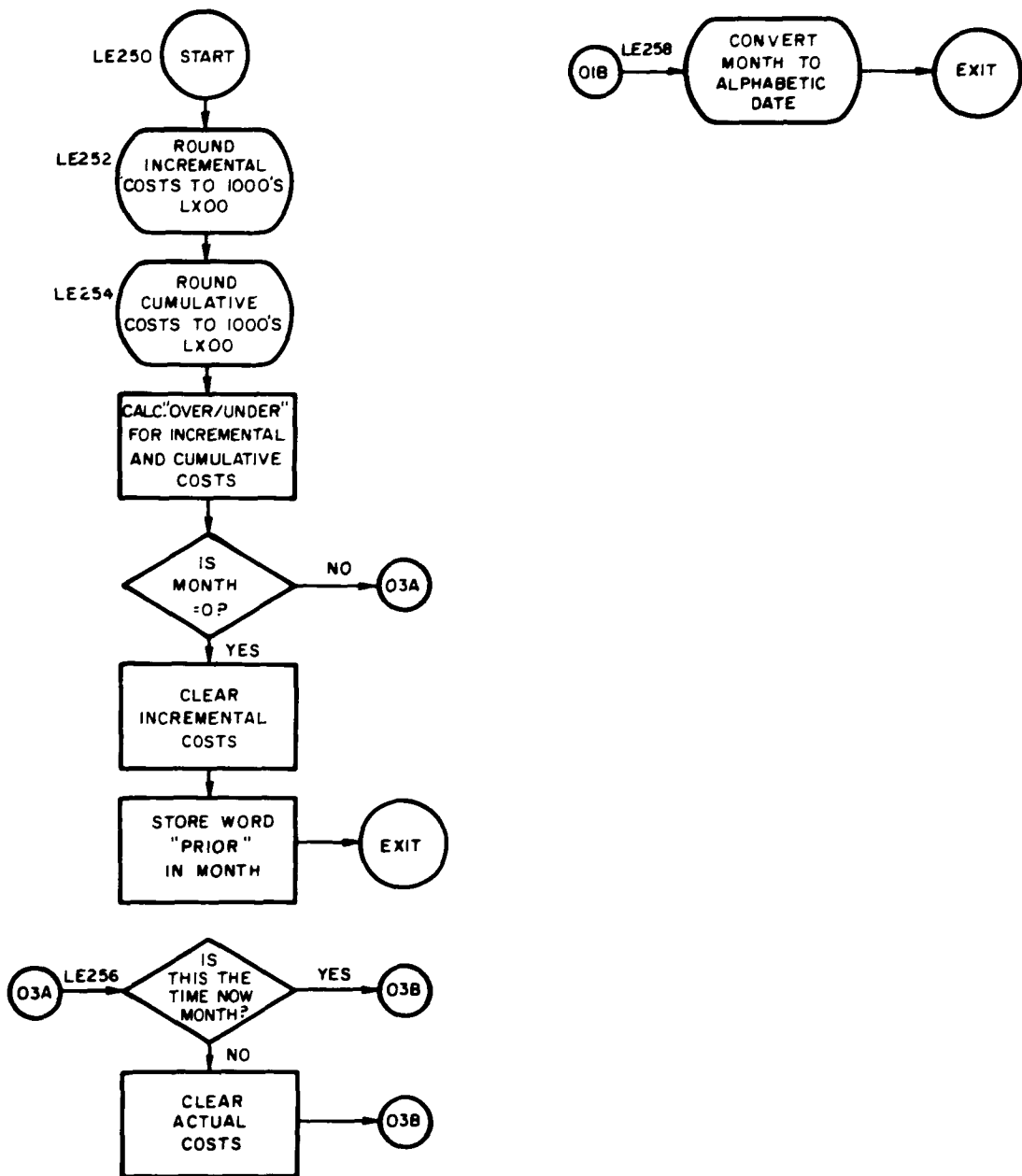


REGION LE10

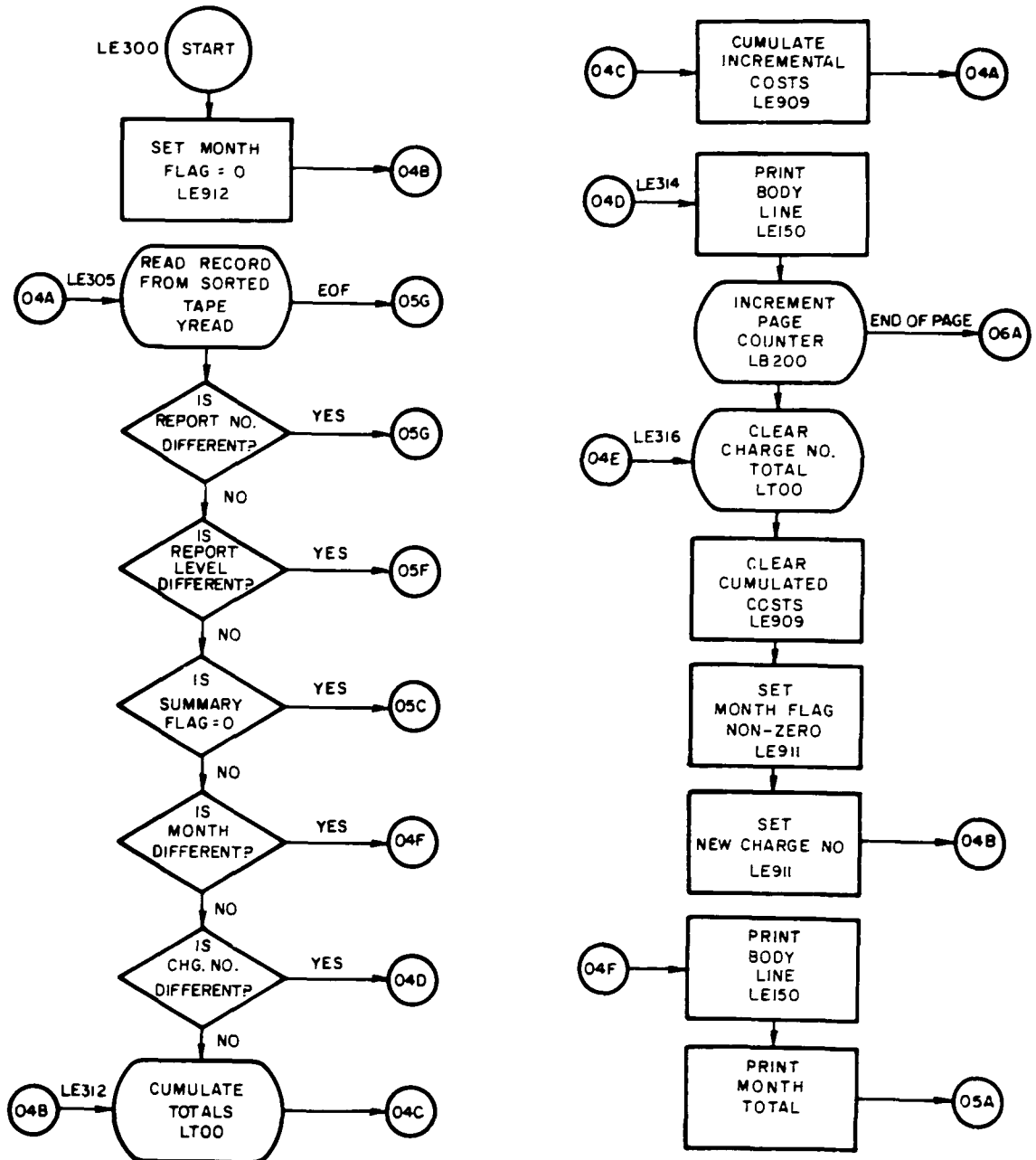
---



REGION LE10  
SUBREGION LE250

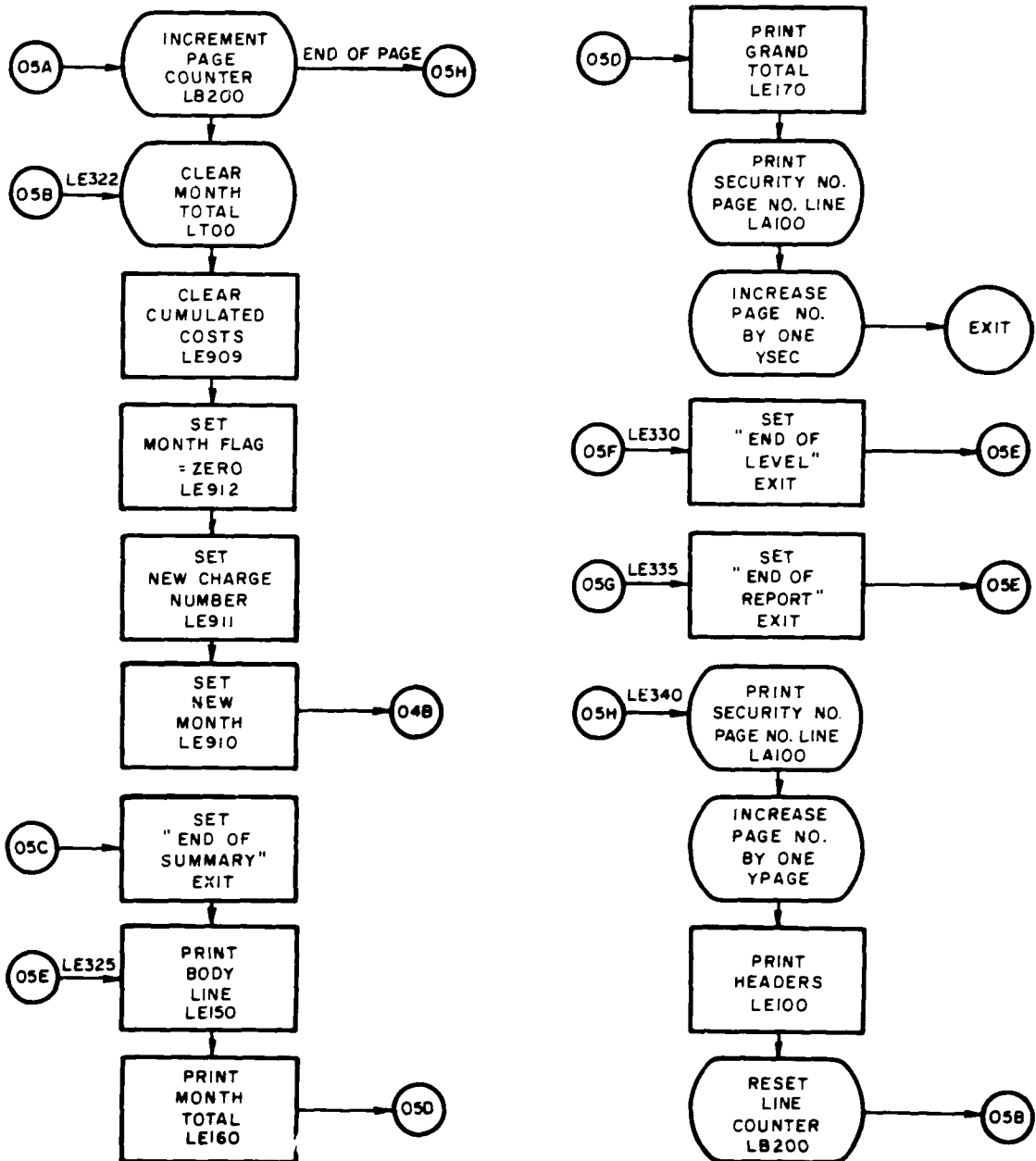


REGION LE10  
SUBREGION LE300



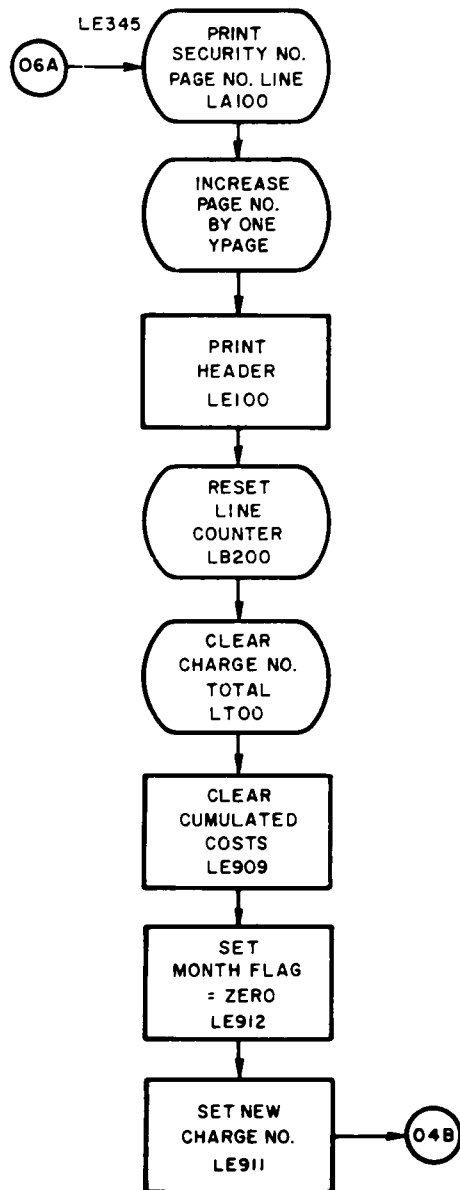


REGION LE10  
SUBREGION LE300

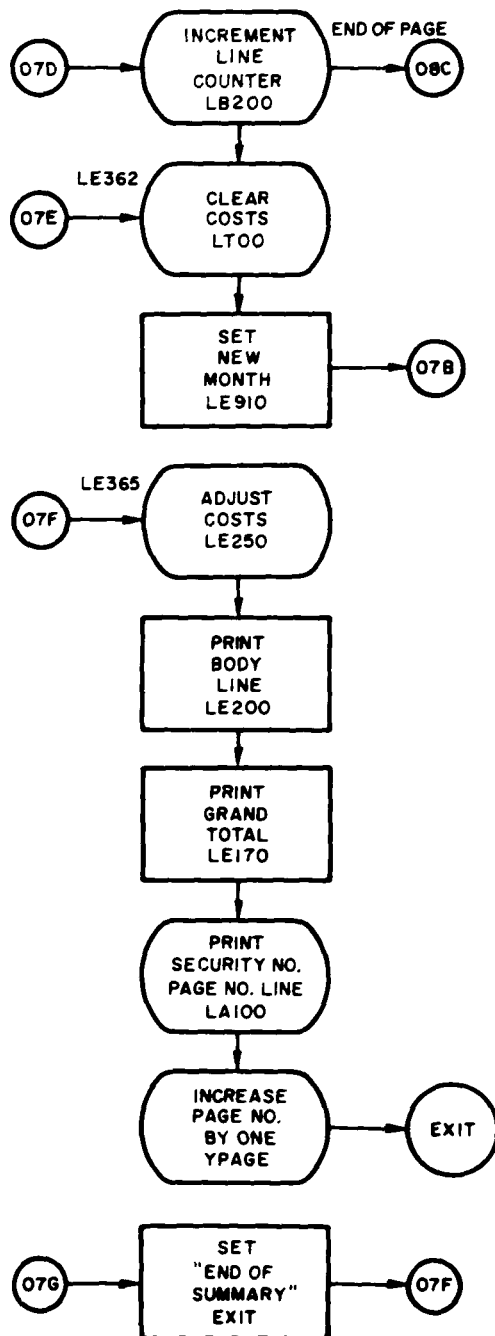
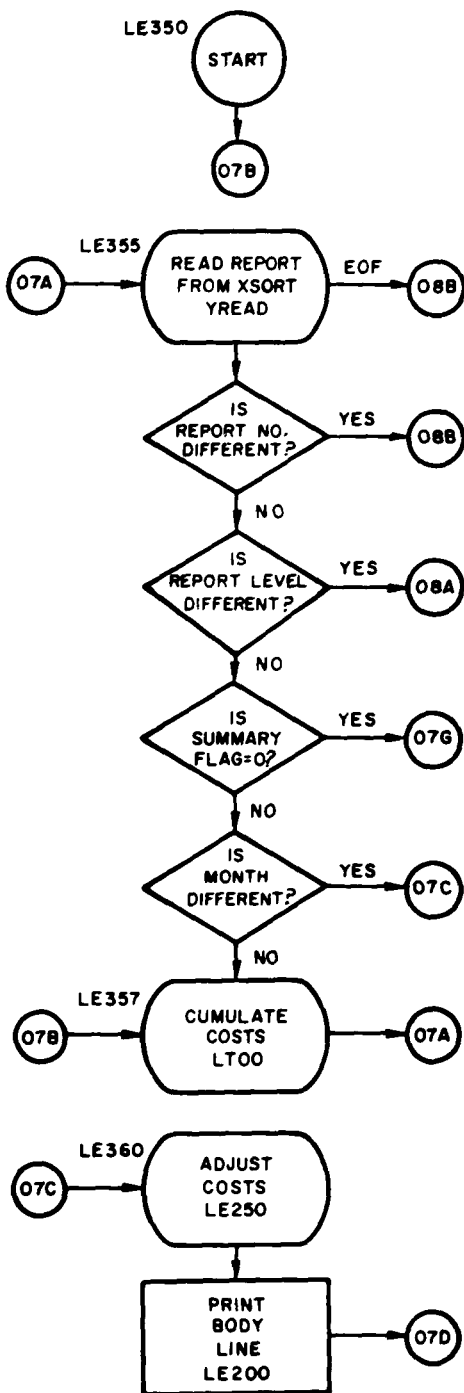


REGION LE10  
SUBREGION LE300

---

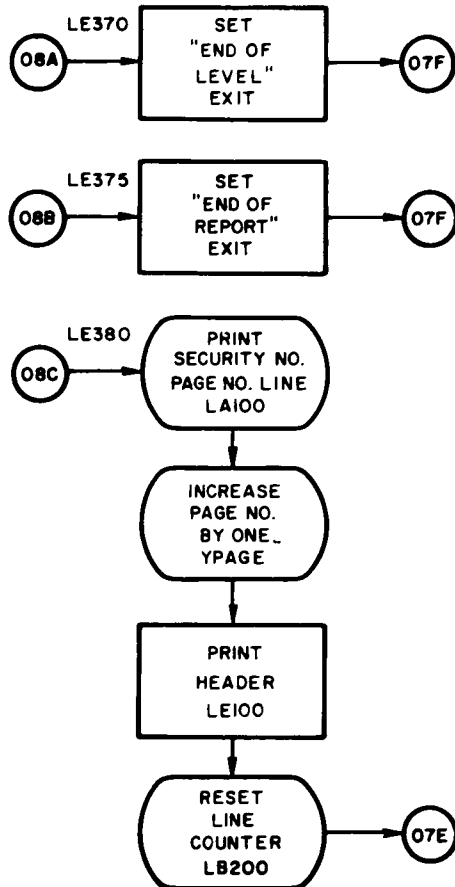


REGION LE10  
SUBREGION LE350

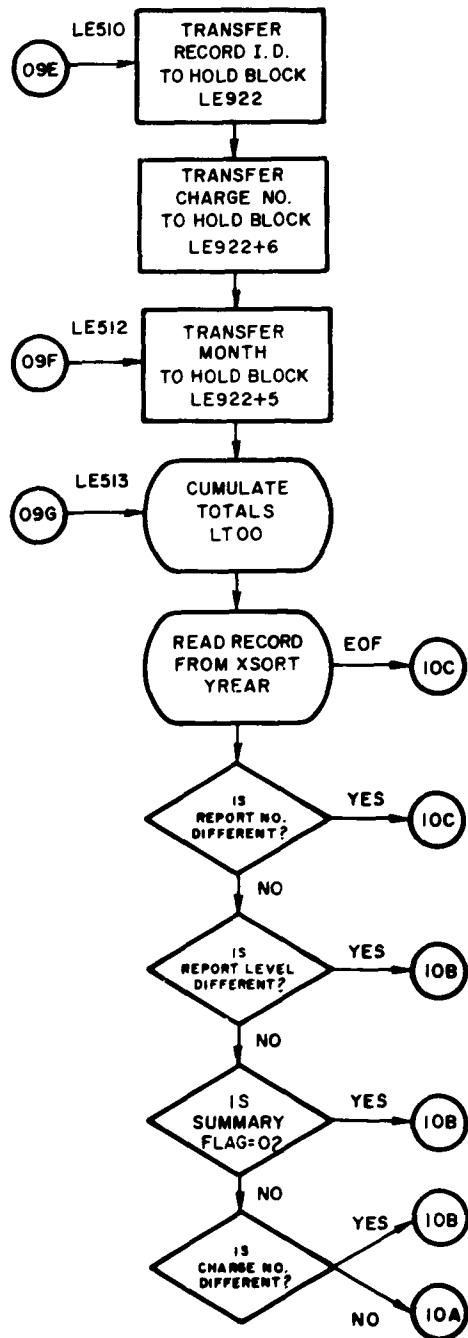
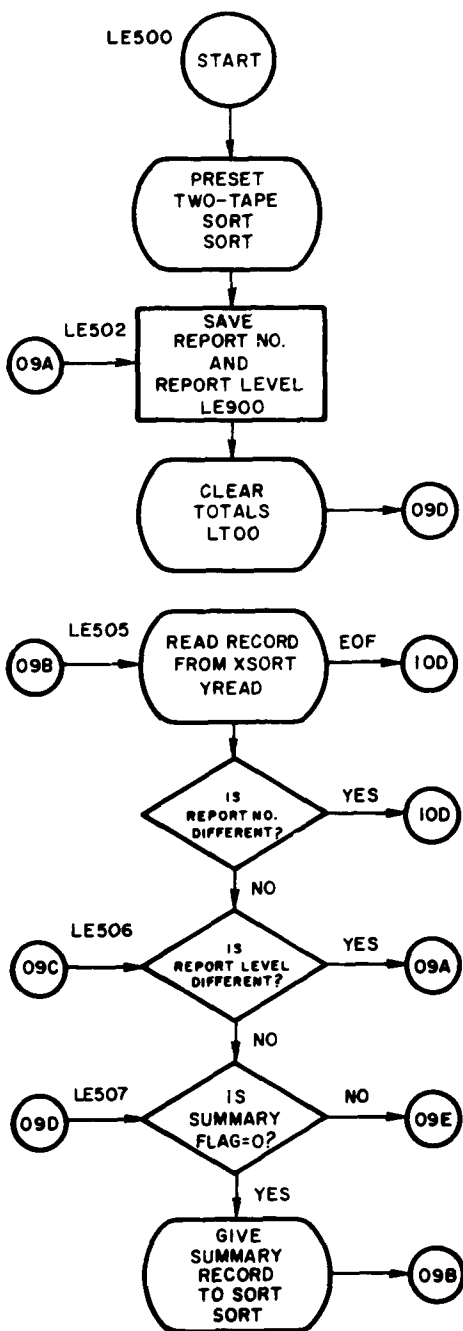


REGION LE10  
SUBREGION LE350

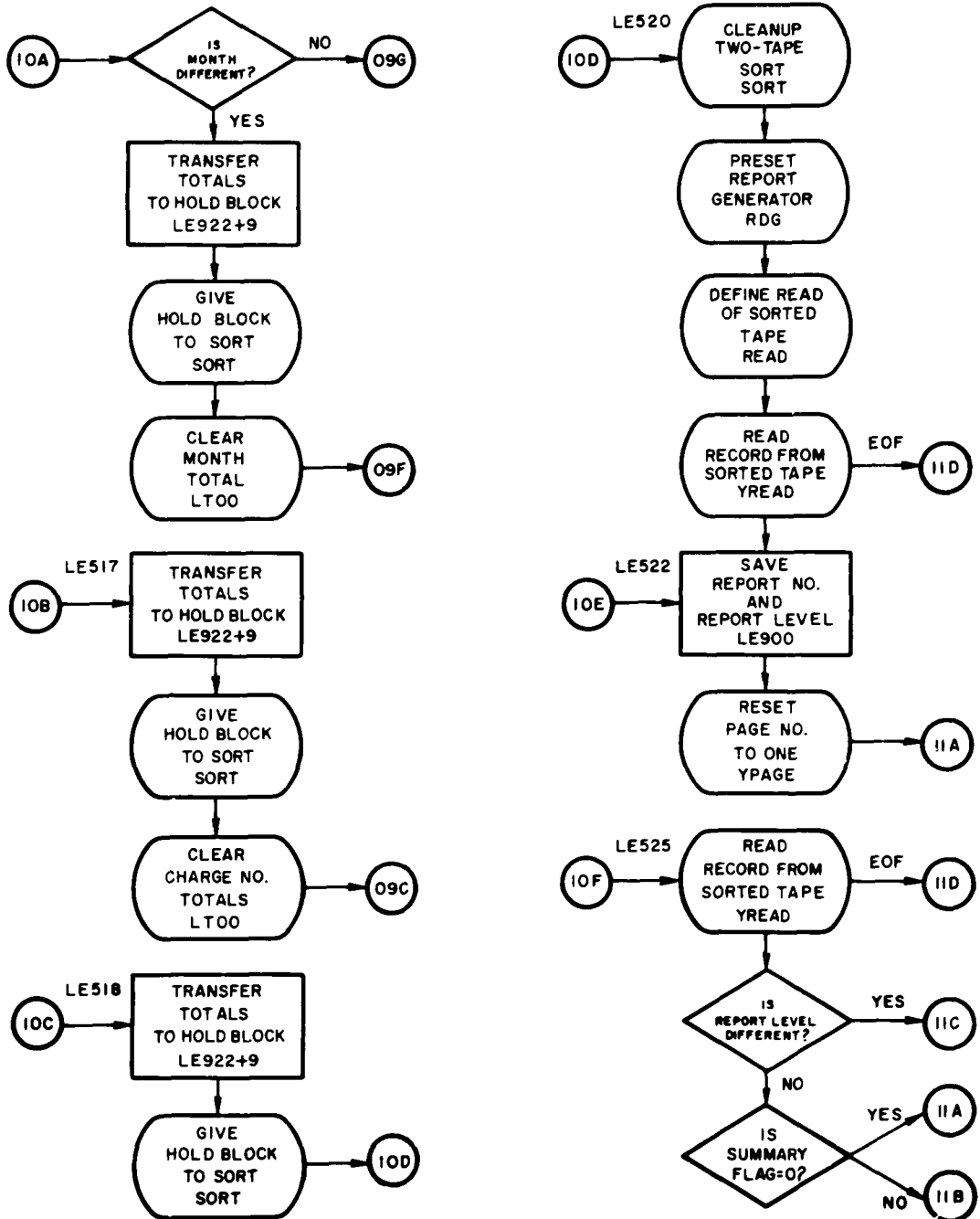
---



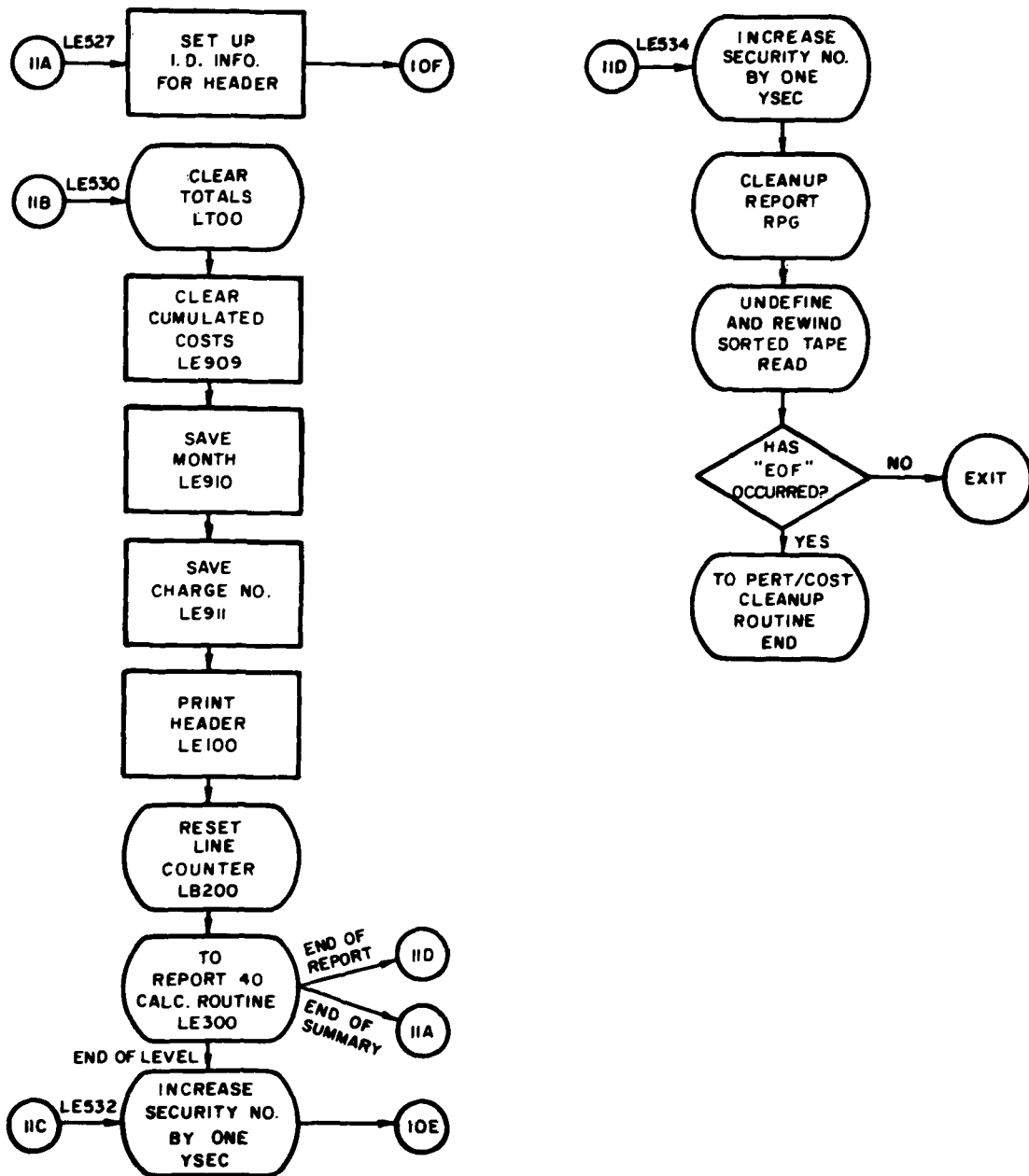
REGION LE10  
SUBREGION LE500



REGION LE10  
SUBREGION LE500



REGION LE10  
SUBREGION LES00



Region LF00

**EXPLANATION OF REGION:**

To cumulate cost information up the work breakdown structure and print report 35.

**CALLING SEQUENCE:**

L     TSX    LF00, 4

L+1   Normal return

**INPUT:**

Report 35 information from XSORT.

**OUTPUT:**

Report 35 on output report tape.

**STORAGE USED:**

Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

SORT           YREAD       YCOMP

READ           YPAGE       LA100

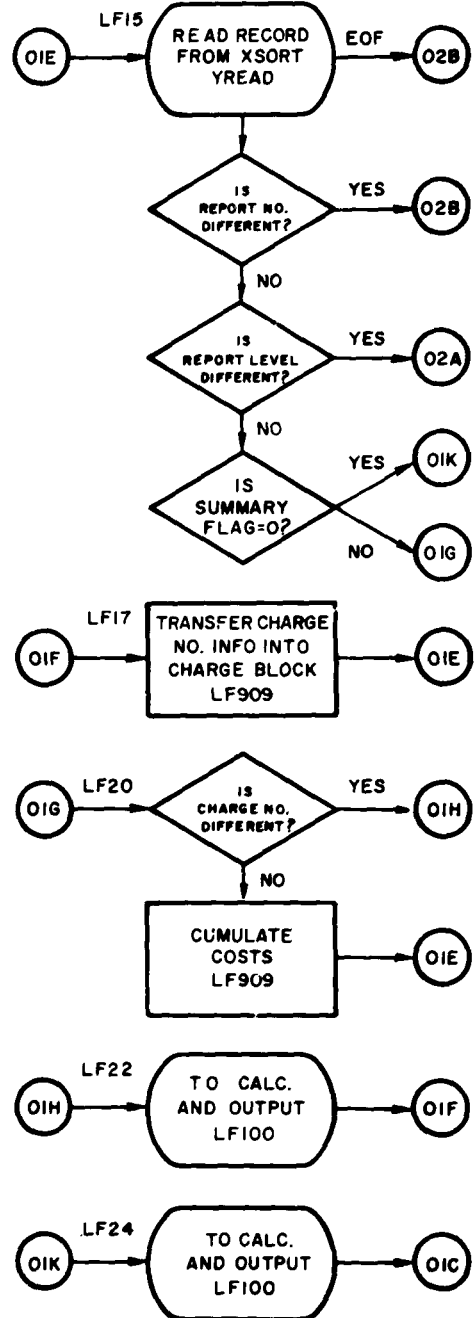
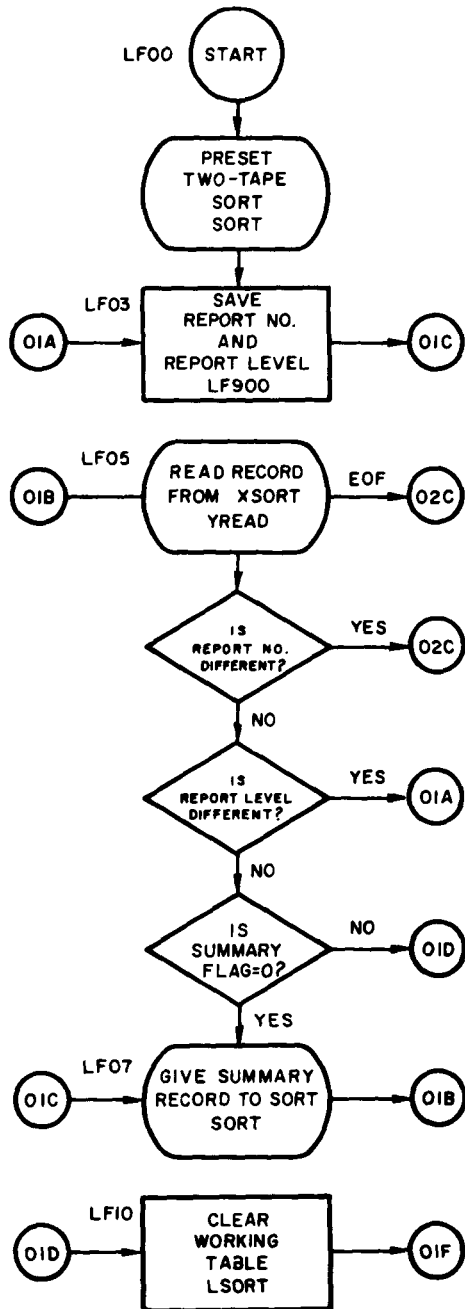
YSEC           LX00        UPCK

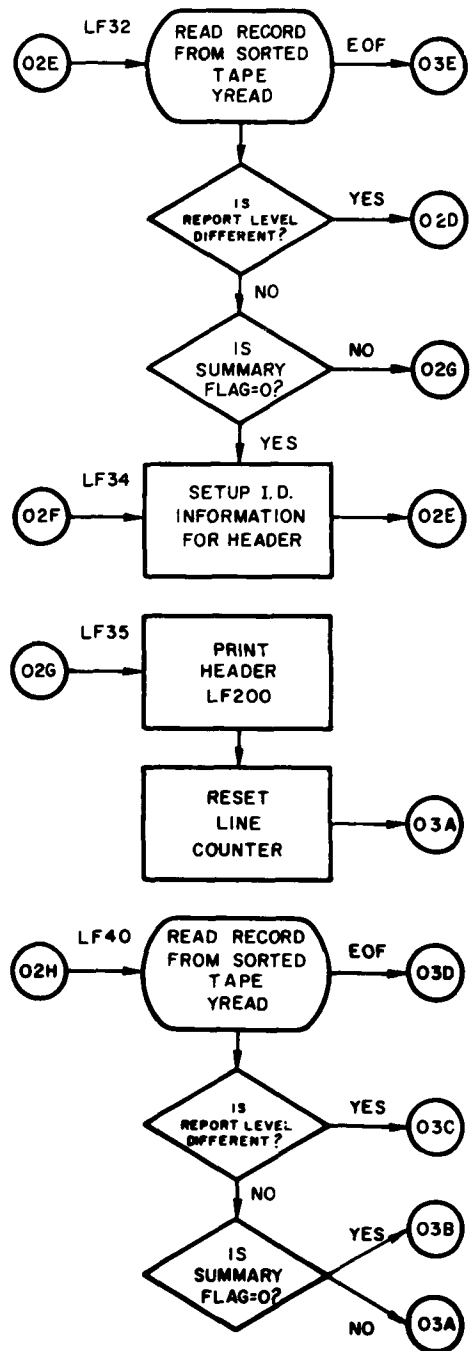
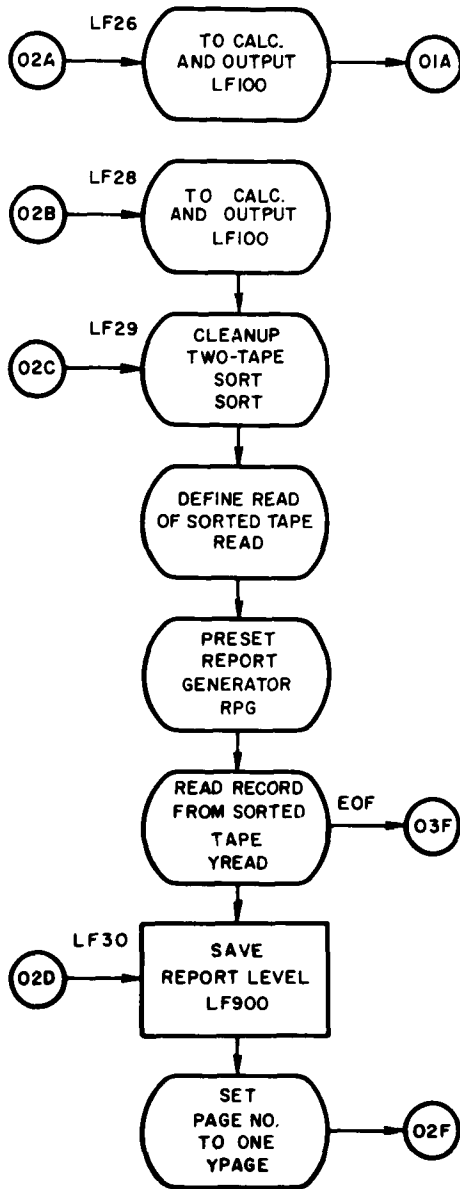
**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.

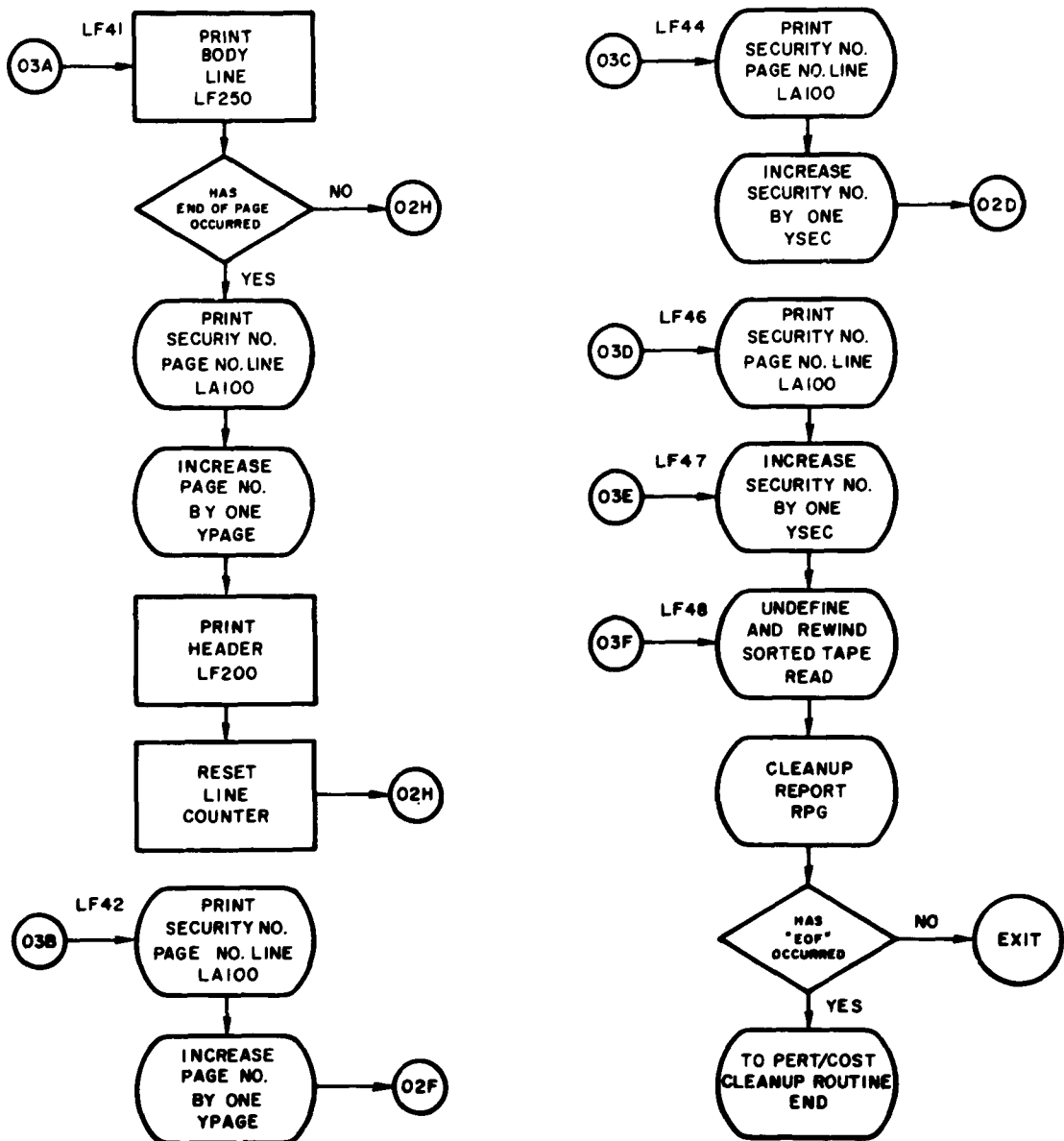


REGION LF00

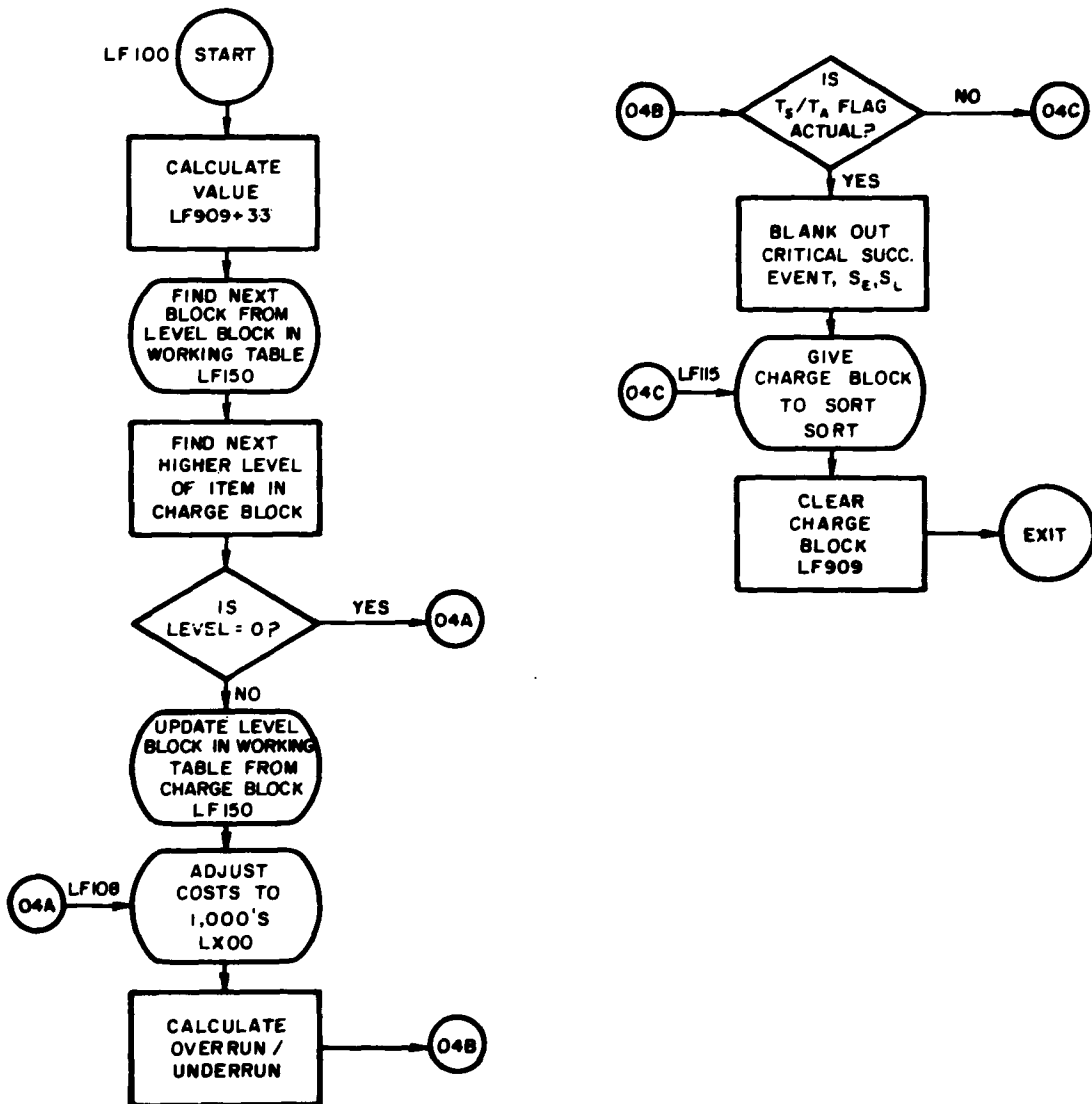




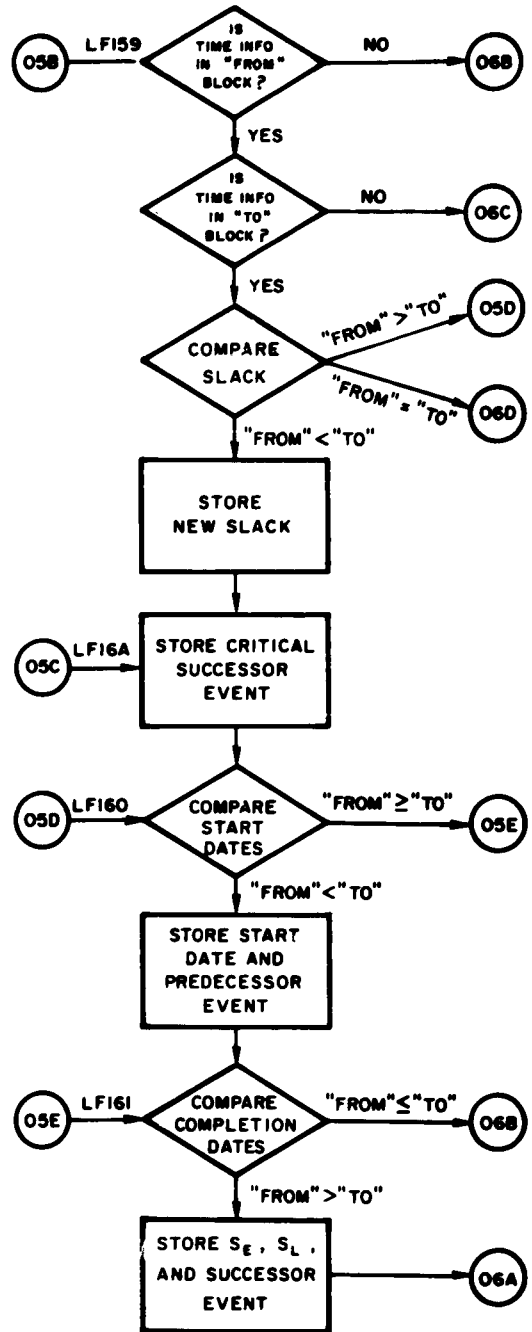
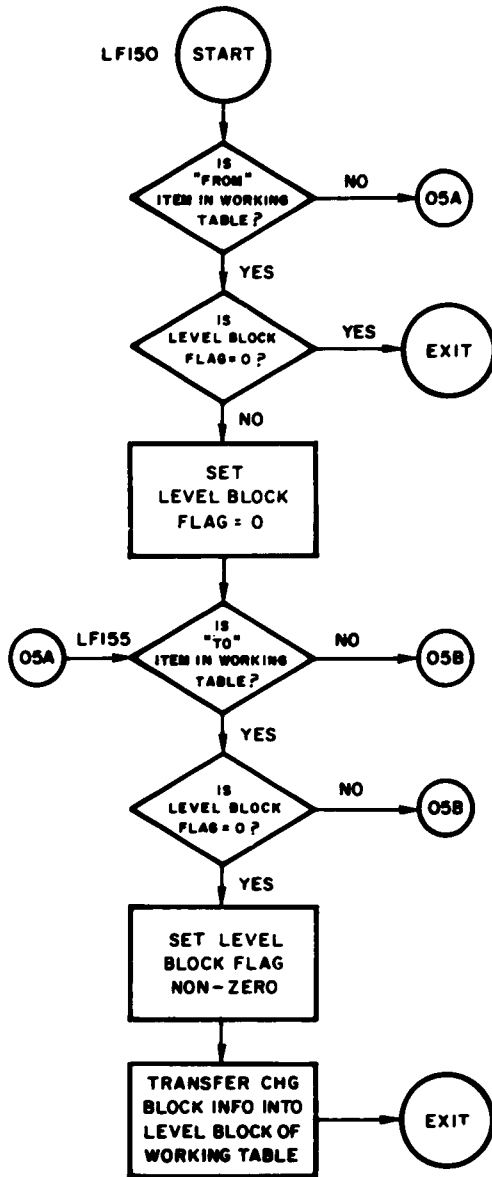
REGION LFOO



REGION LFOO  
SUBREGION LF100

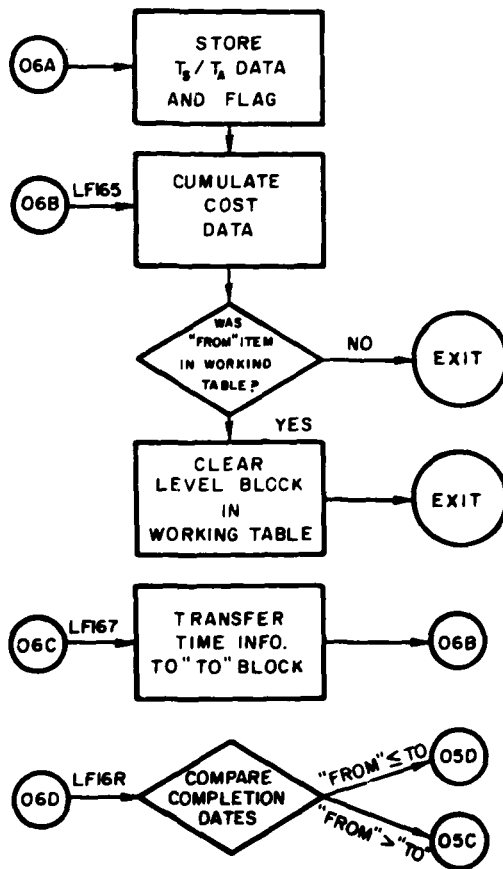


REGION LFOO  
SUBREGION LF150



REGION LF00  
SUBREGION LF150

---



Region LG00

EXPLANATION OF REGION:

Setup region for printing Report 50.

CALLING SEQUENCE:

L TSX LG00, 4

L+1 Normal return

INPUT:

Report 50 information from XSORT.

OUTPUT:

Report 50 on output report tape.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

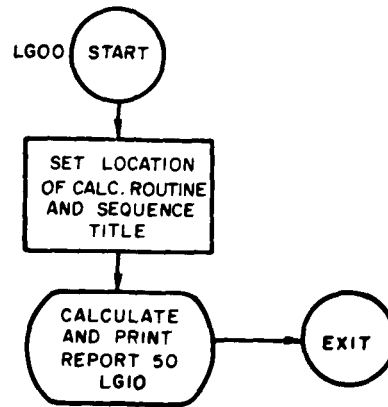
LG10

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION LG00

---





Region LG05

EXPLANATION OF REGION:

Setup region for printing Report 51.

CALLING SEQUENCE:

L TSX LG05, 4

L+1 Normal return

INPUT:

Report 51 information from XSORT.

OUTPUT:

Report 51 on output report tape.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

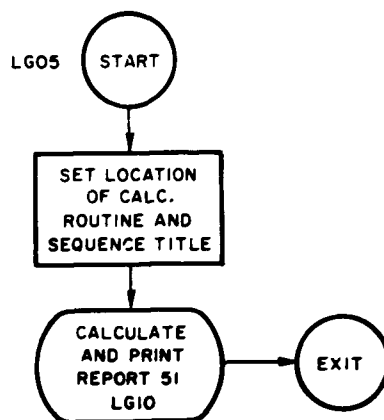
LG10

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION LG05

---



Region LG07

EXPLANATION OF REGION:

Setup region for Report 52.

CALLING SEQUENCE:

L TSX LG07, 4

L+1 Normal return

INPUT:

Report 52 information from XSORT.

OUTPUT:

Report 52 on output report tape.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

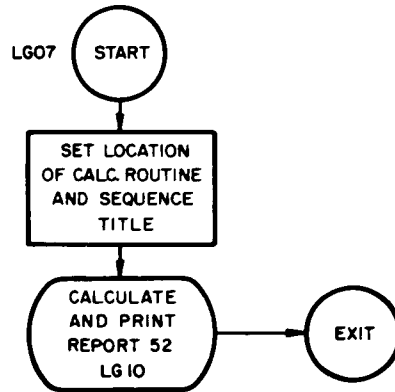
LG10

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION LG07

---



Region LG10

EXPLANATION OF REGION:

To cumulate data and print "Manpower Loading Report."

CALLING SEQUENCE:

L     TSX    LG10, 4  
L+1 PZE    0, 0, R  
L+2 PZE    A,, B  
L+3 Normal return

INPUT:

Information from XSORT routine.

OUTPUT:

Report on output report tape.

STORAGE USED:

Not applicable.

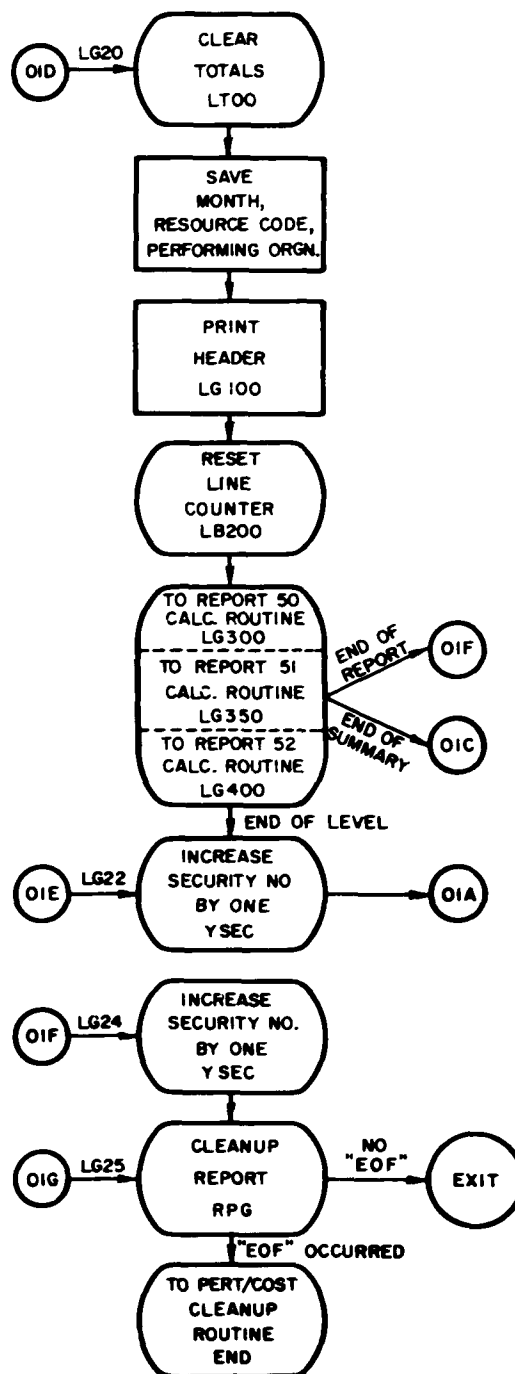
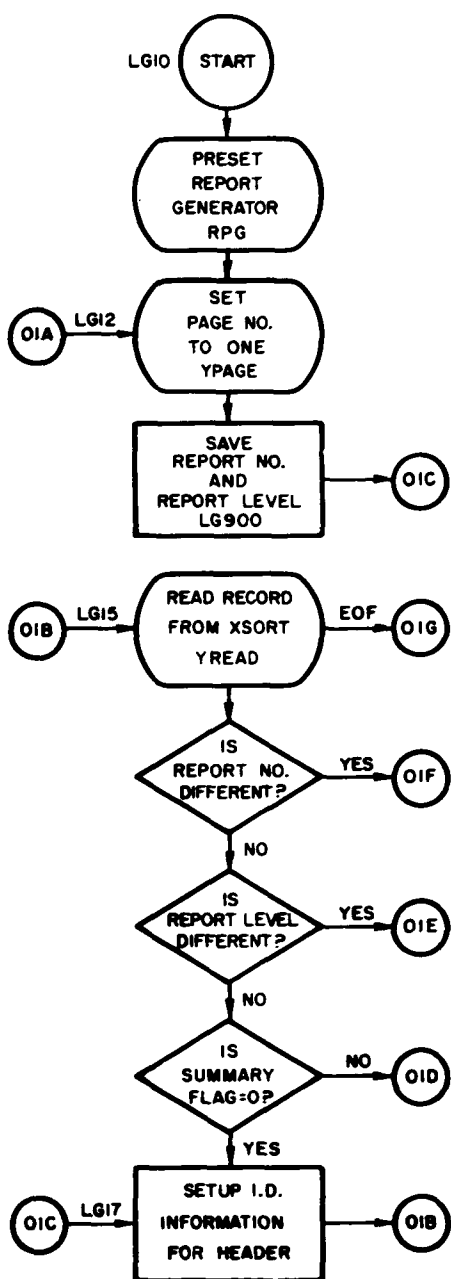
SUBREGIONS AND SUBROUTINES USED:

YPAGE       YREAD       LT00  
LB200       YSEC        DATE  
LA100

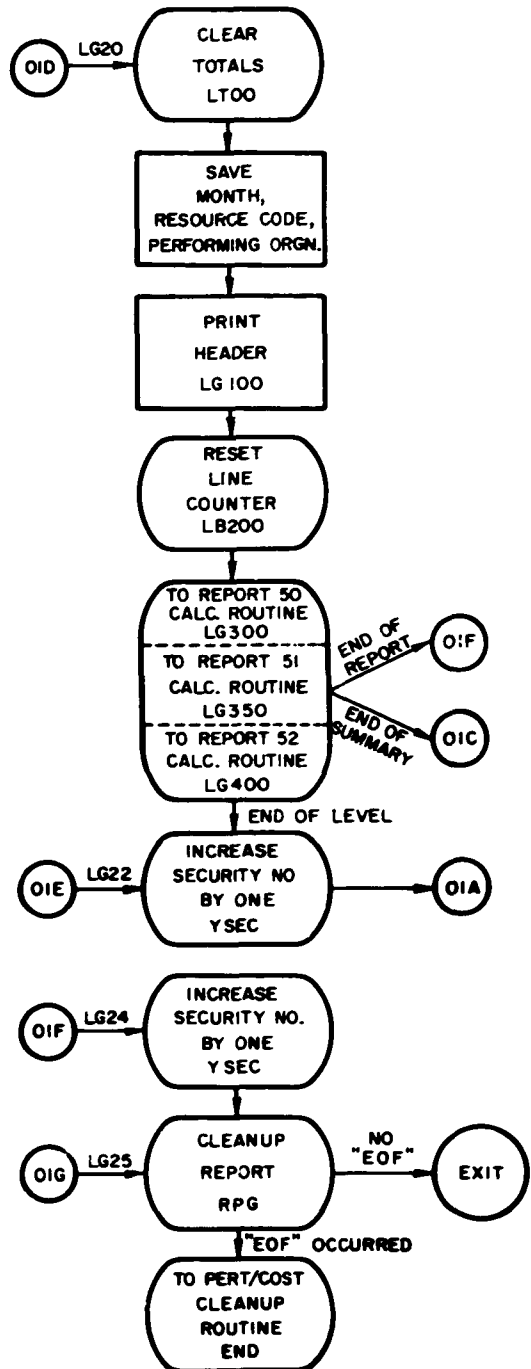
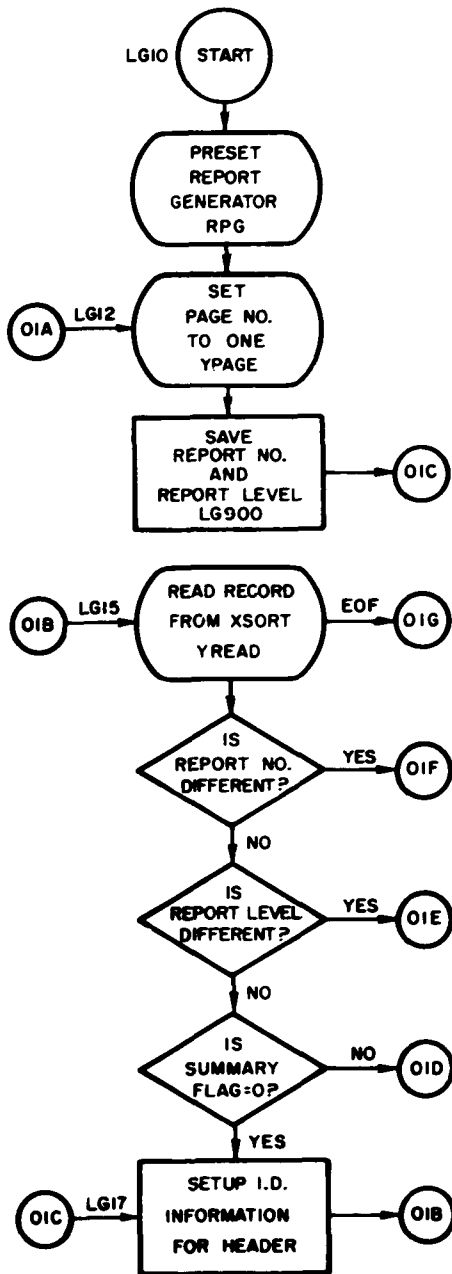
EXPLANATION OF CALLING SEQUENCE:

R = report number  
A = location of calculation routine  
B = location of sort sequence title

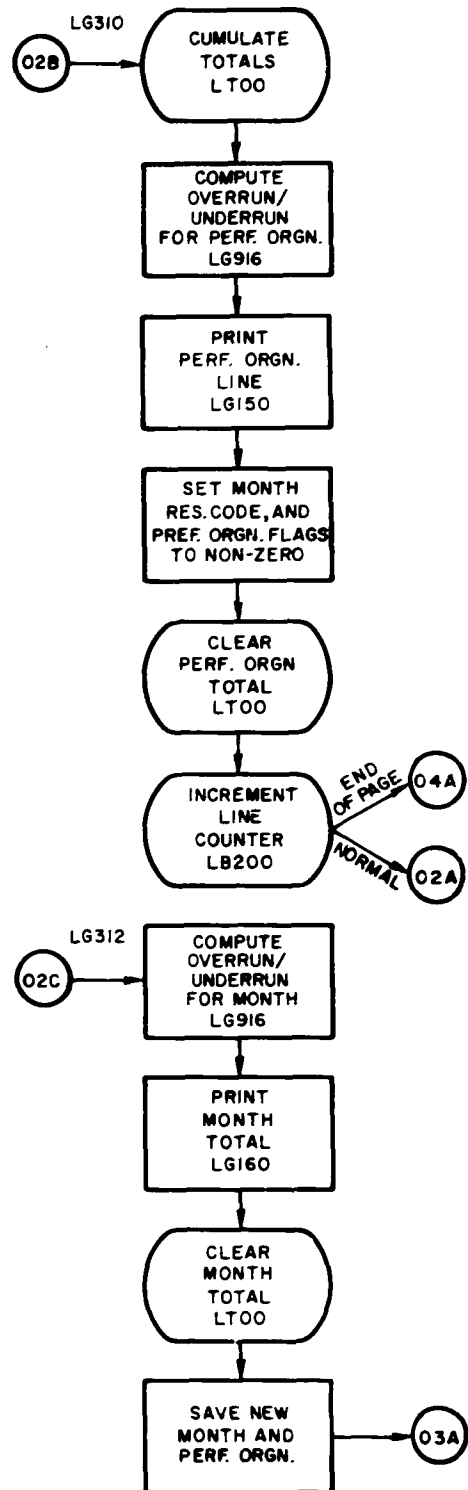
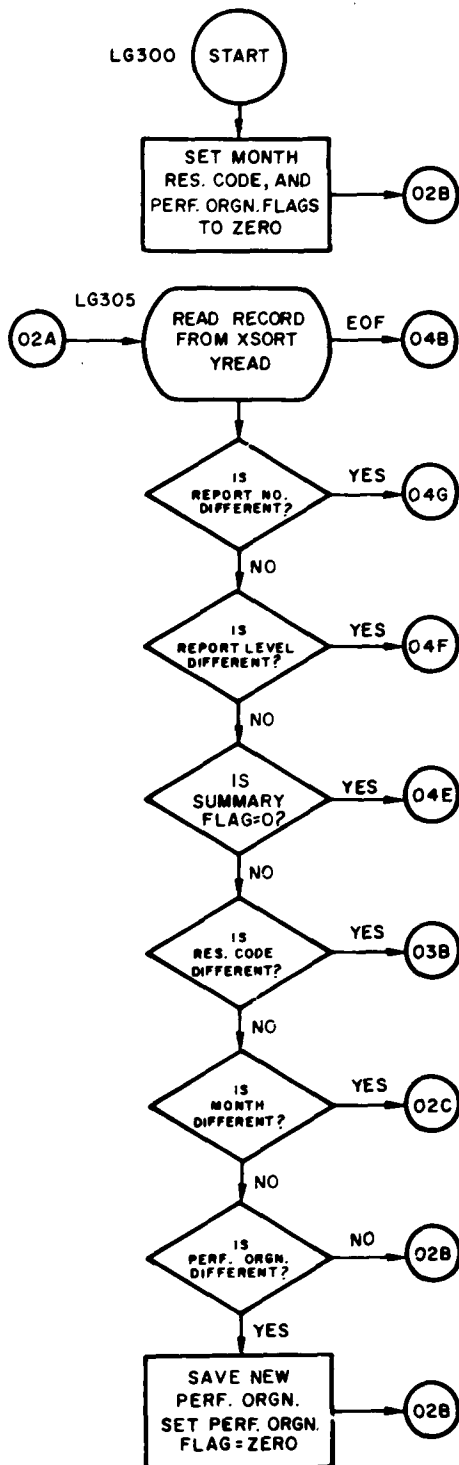
# REGION LG10



# REGION LG10

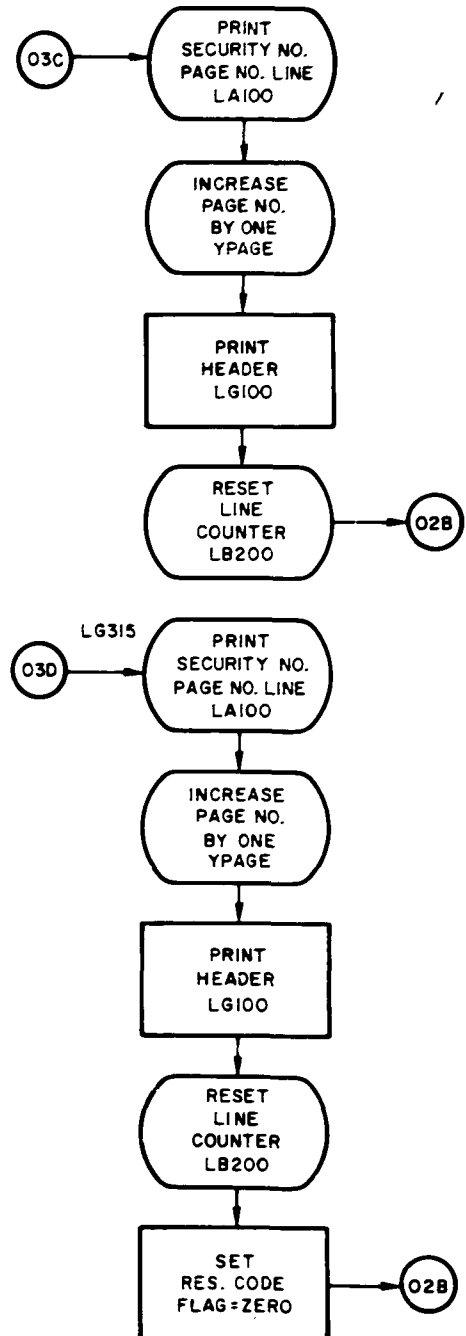
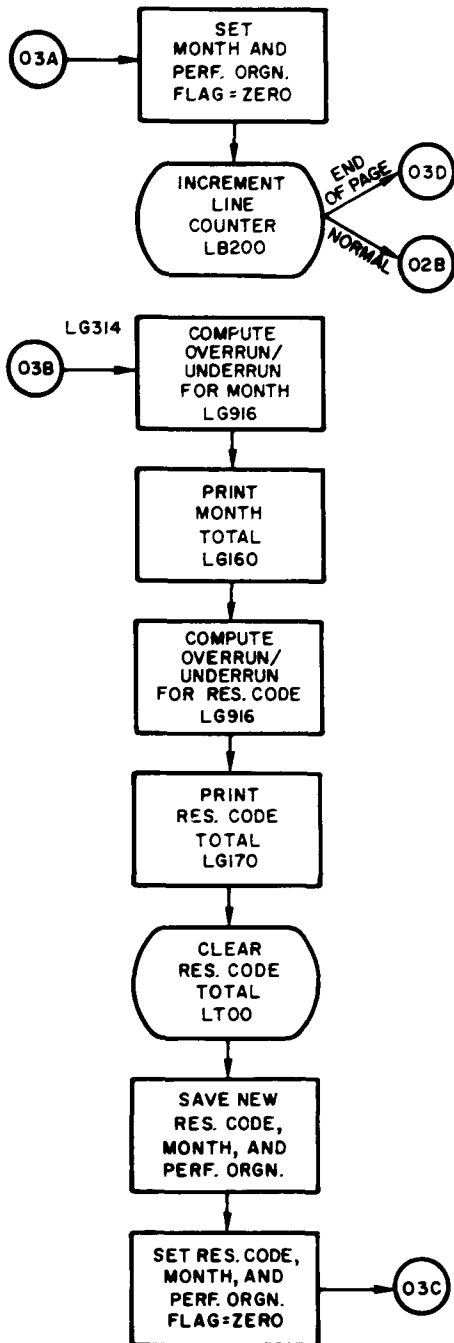


REGION LG10  
SUBREGION LG300

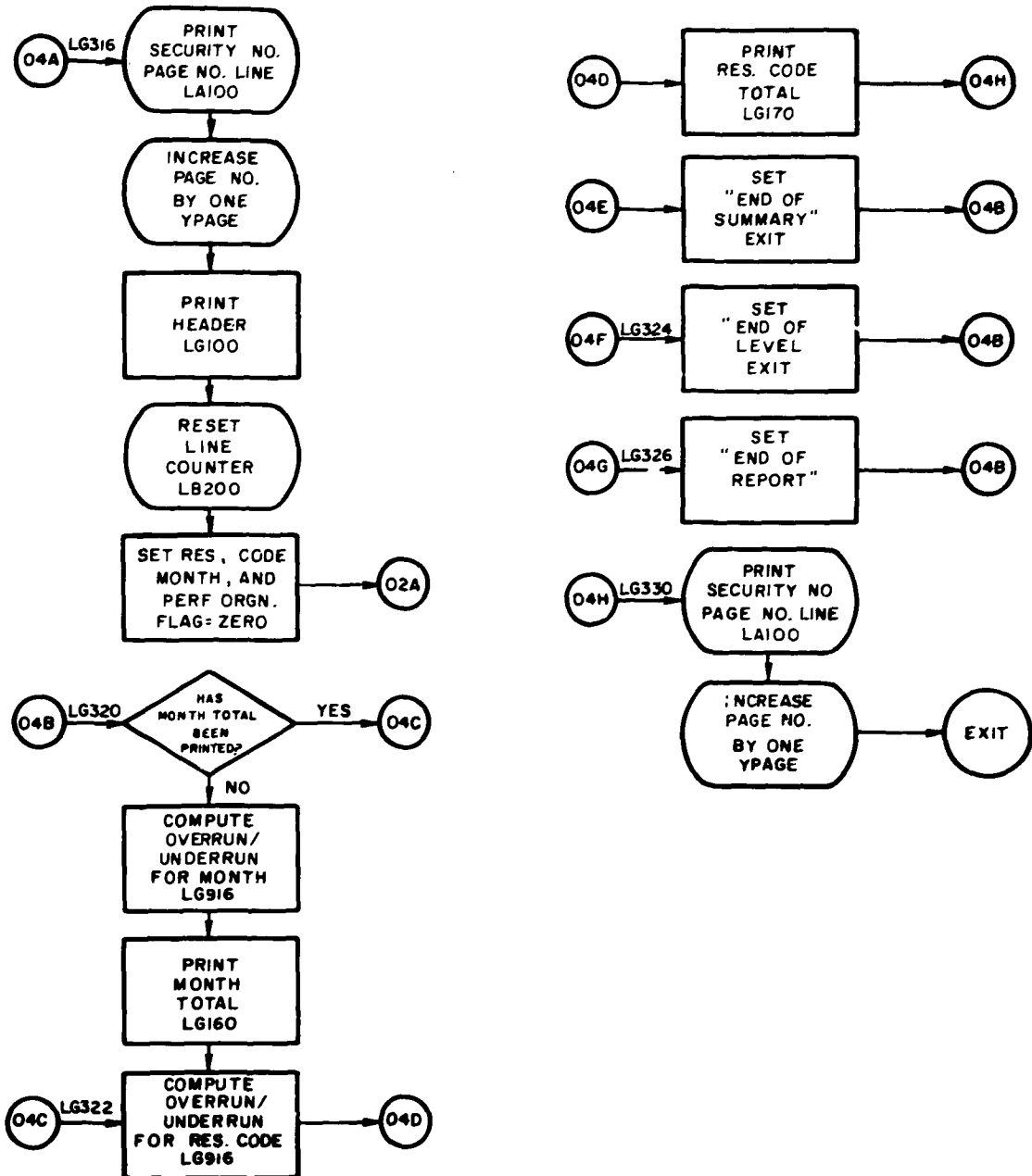




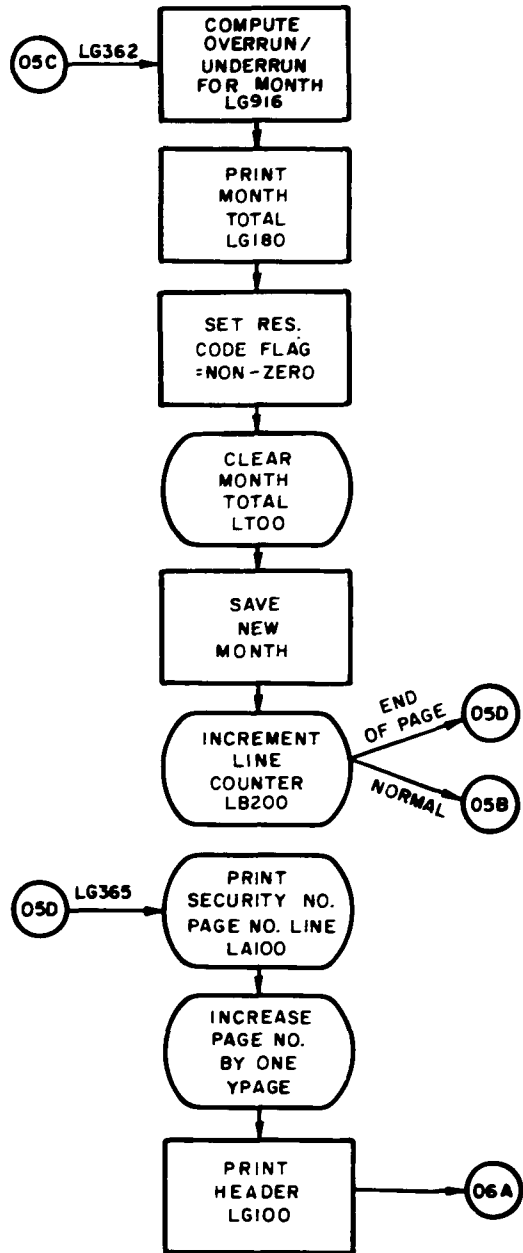
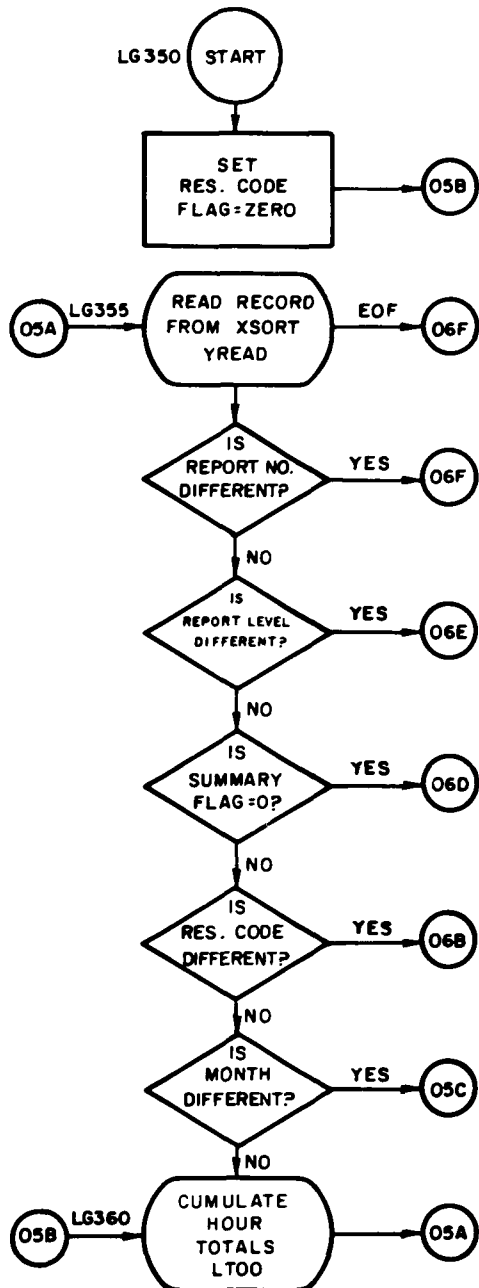
REGION LG10  
SUBREGION LG300



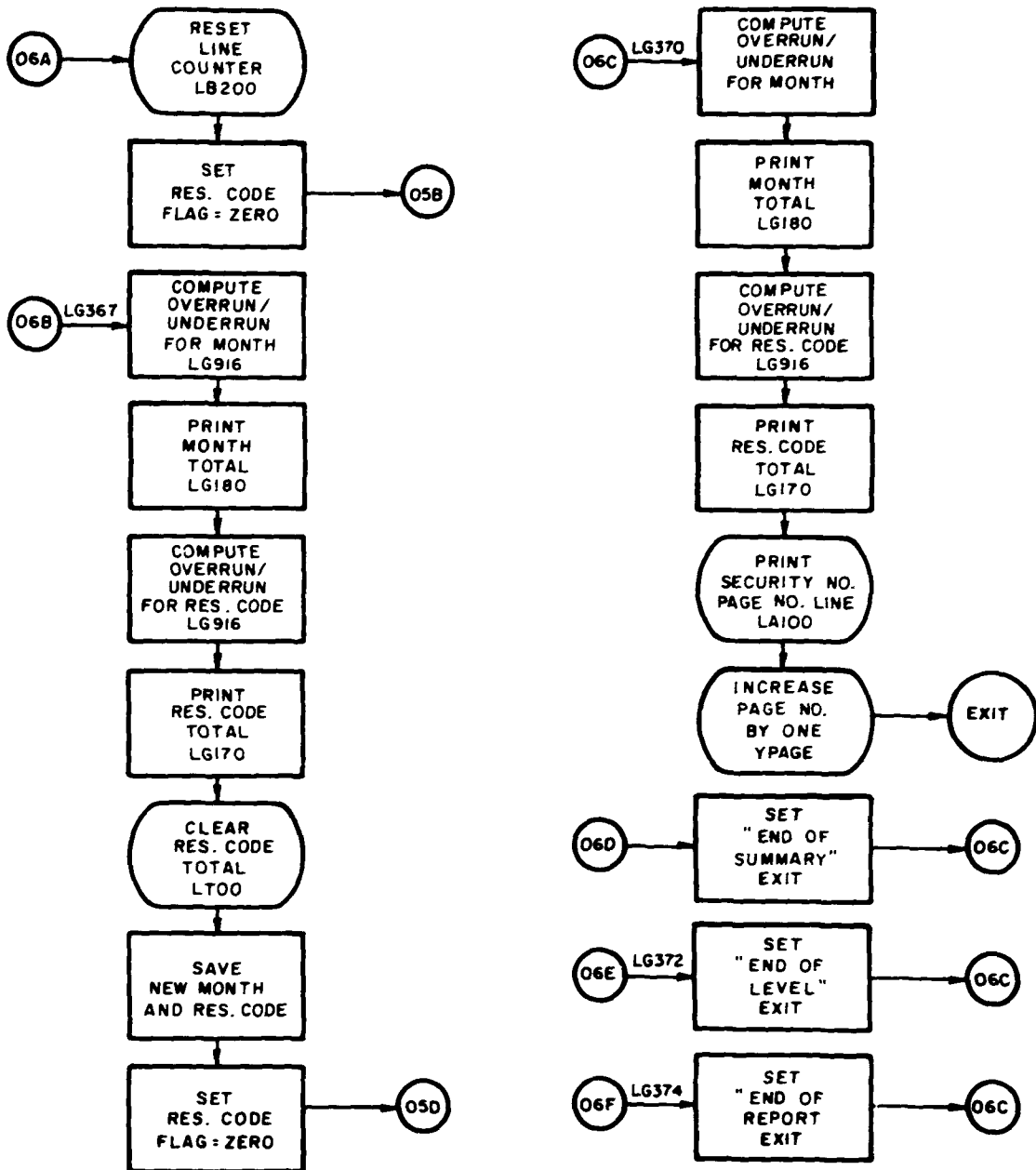
REGION LG10  
SUBREGION LG300



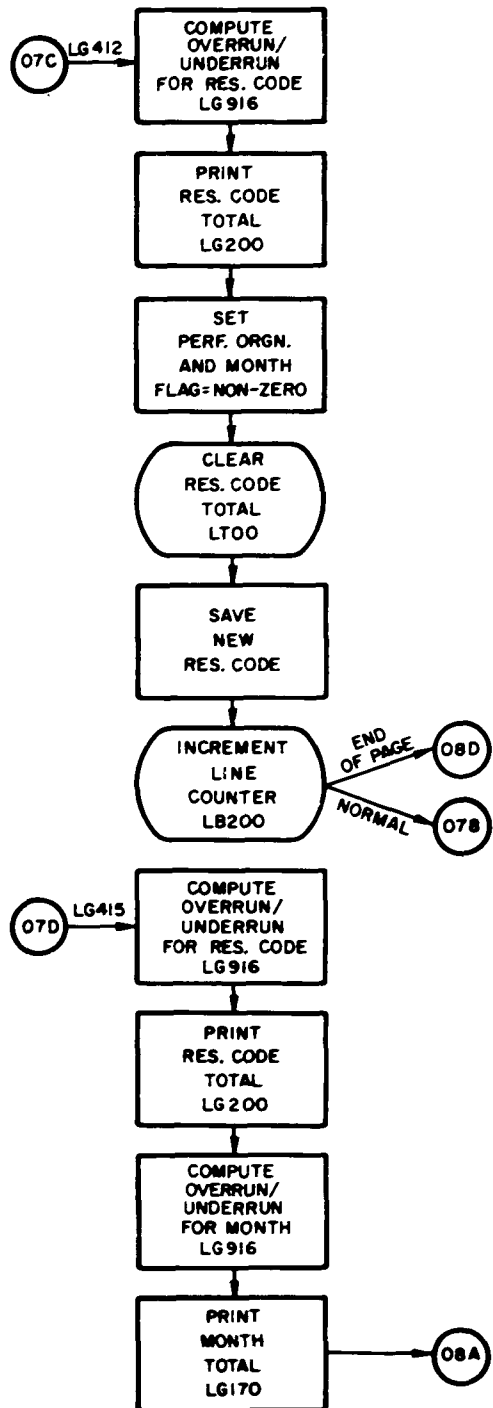
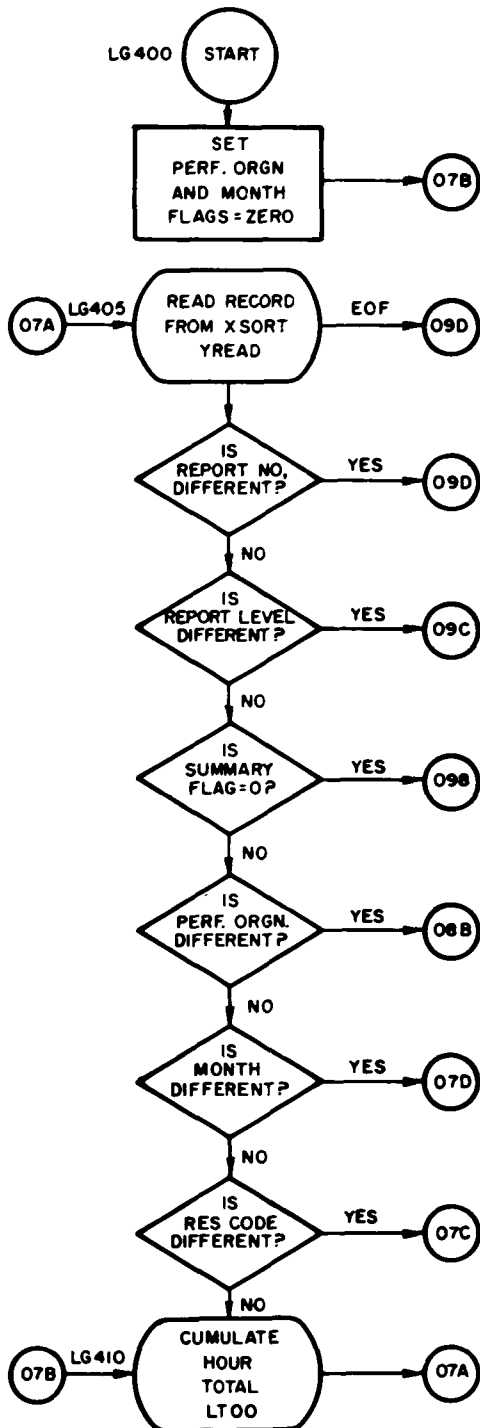
REGION LG10  
SUBREGION LG350



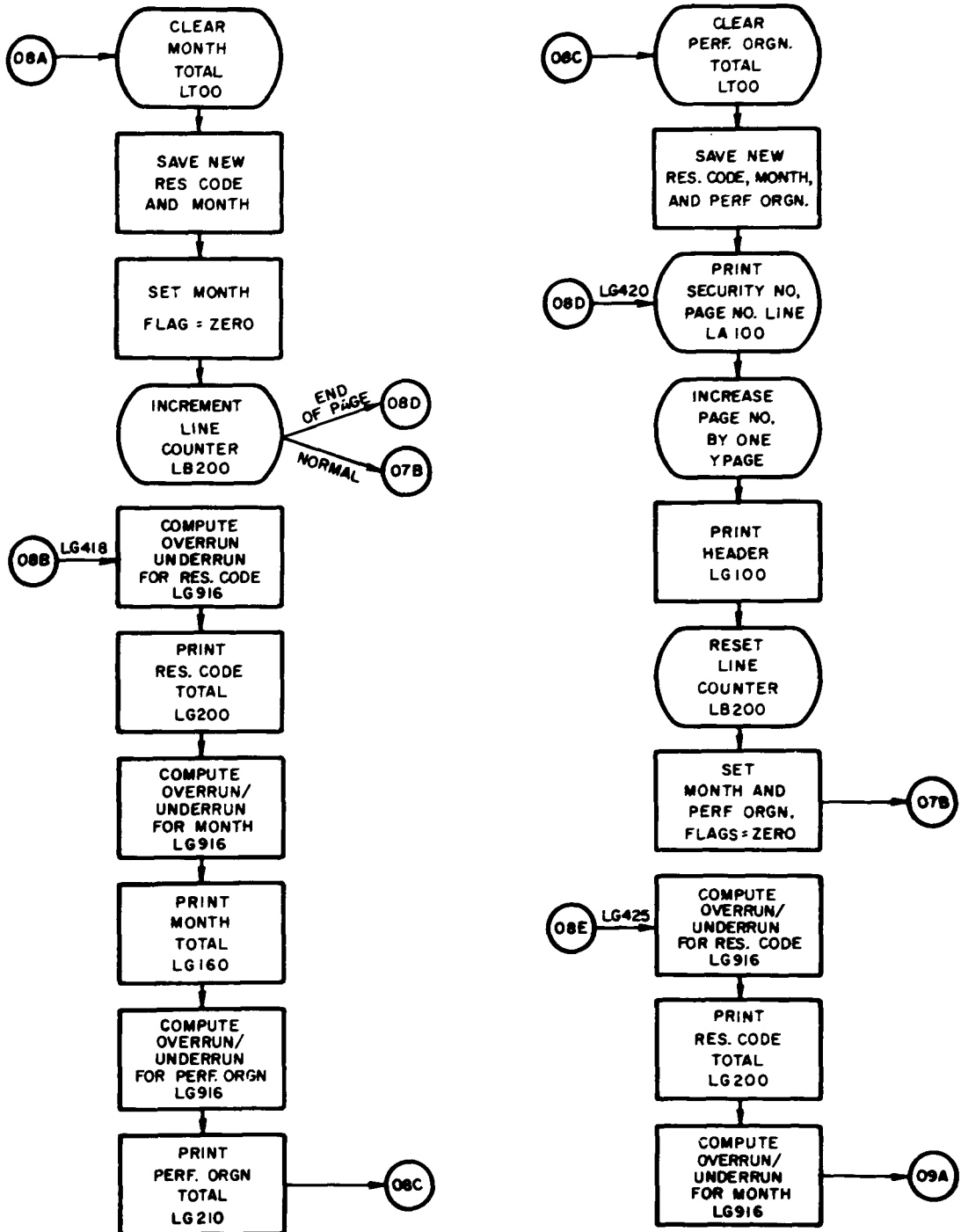
REGION LG10  
SUBREGION LG350



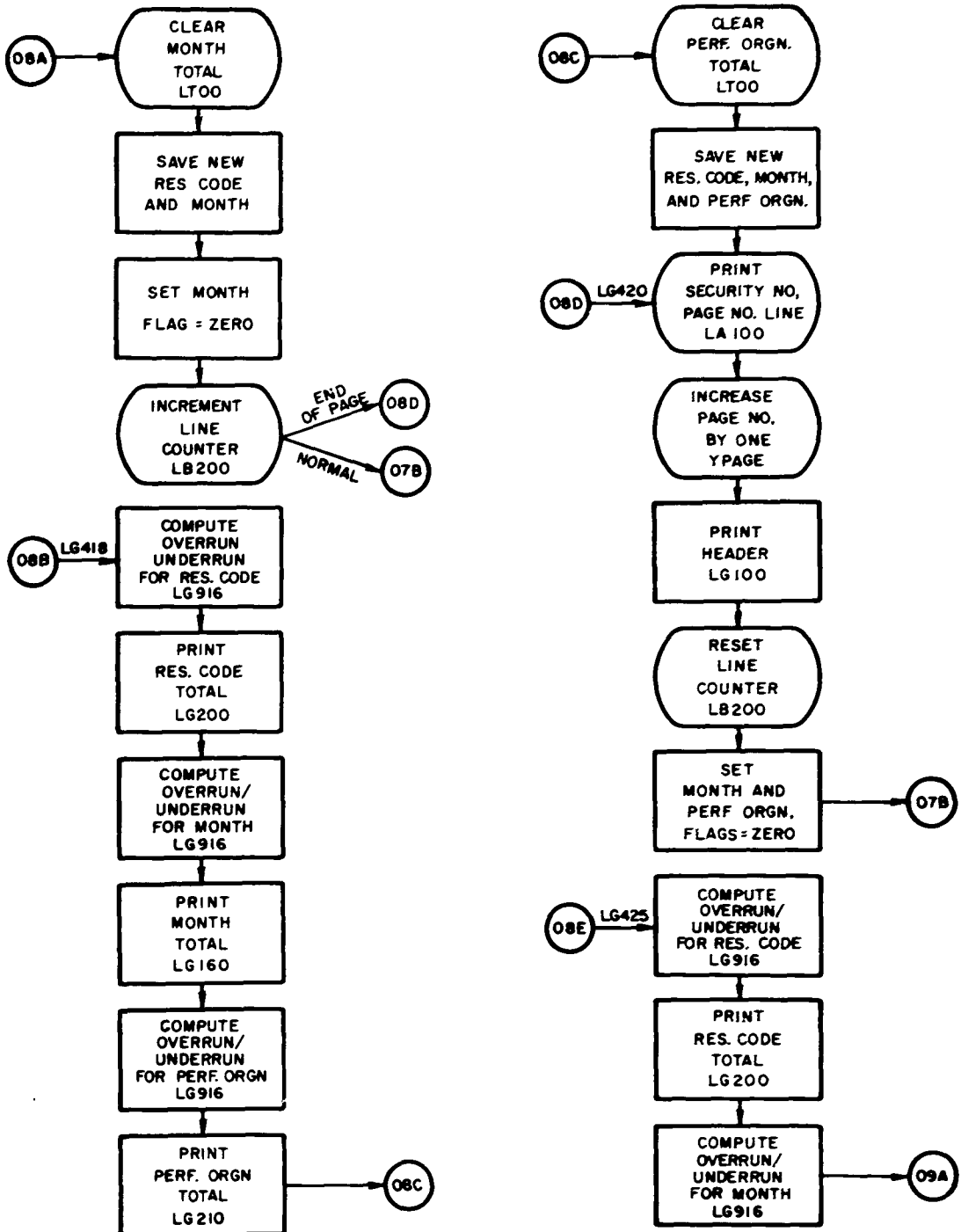
REGION LG10  
SUBREGION LG400



REGION LG10  
SUBREGION LG400

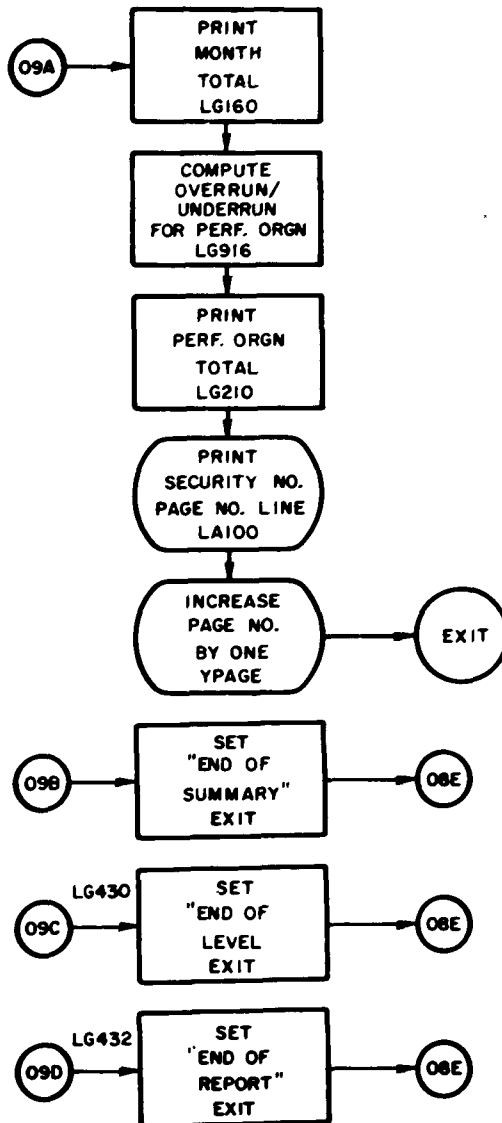


REGION LG10  
SUBREGION LG400



REGION LG10  
SUBREGION LG400

---





Region LH00

EXPLANATION OF REGION:

To cumulate data and print Report 55.

CALLING SEQUENCE:

L TSX LH00, 4

L+1 Normal return

INPUT:

Report 55 information from XSORT.

OUTPUT:

Report 55 on output print tape.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

YPAGE YREAD LT00

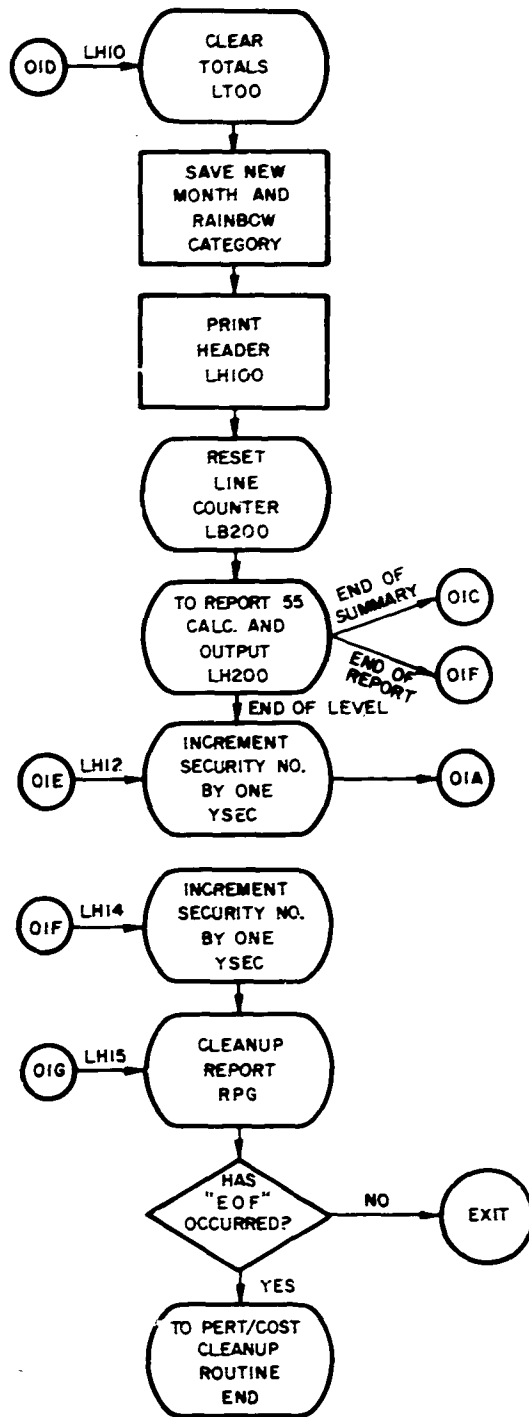
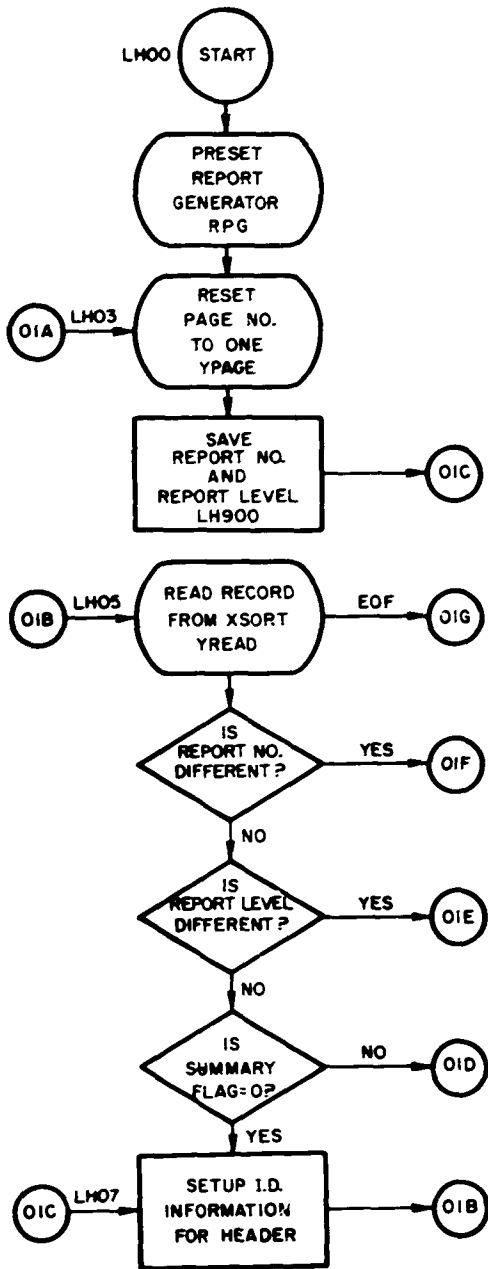
LB200 YSEC DATE

LA100

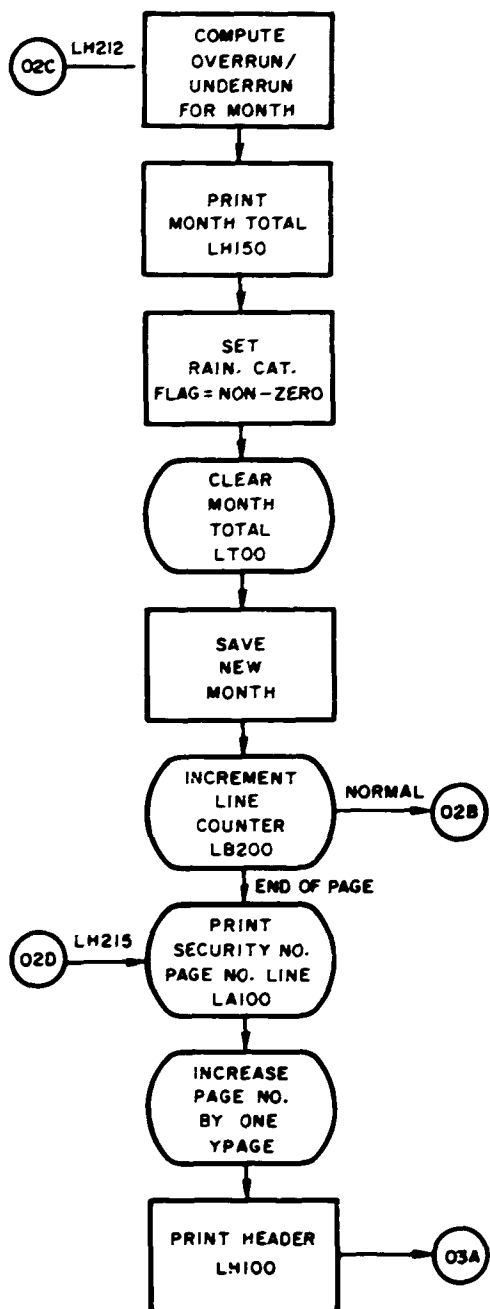
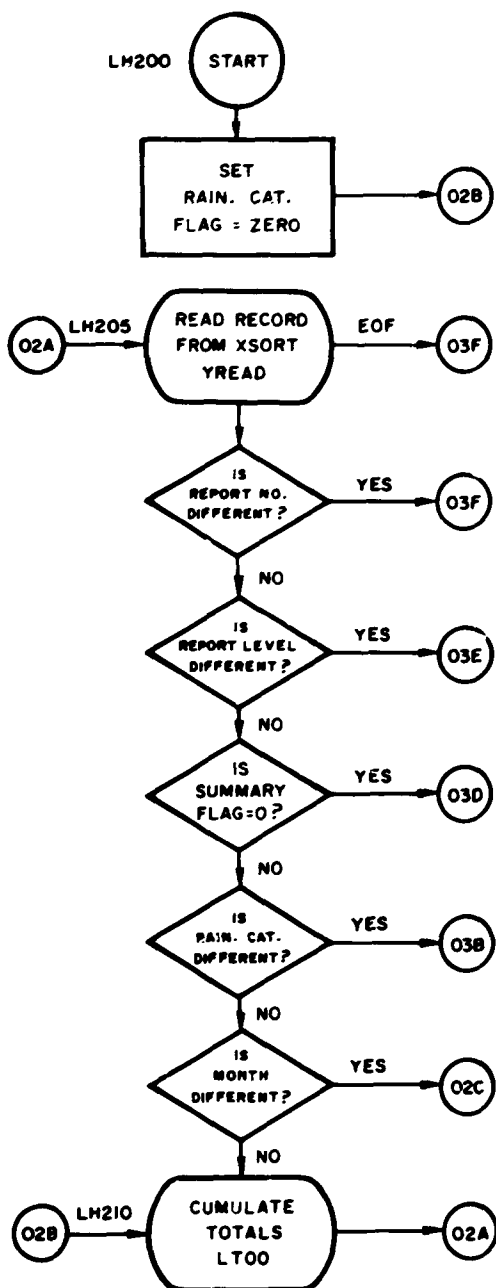
EXPLANATION OF CALLING SEQUENCE:

Not applicable.

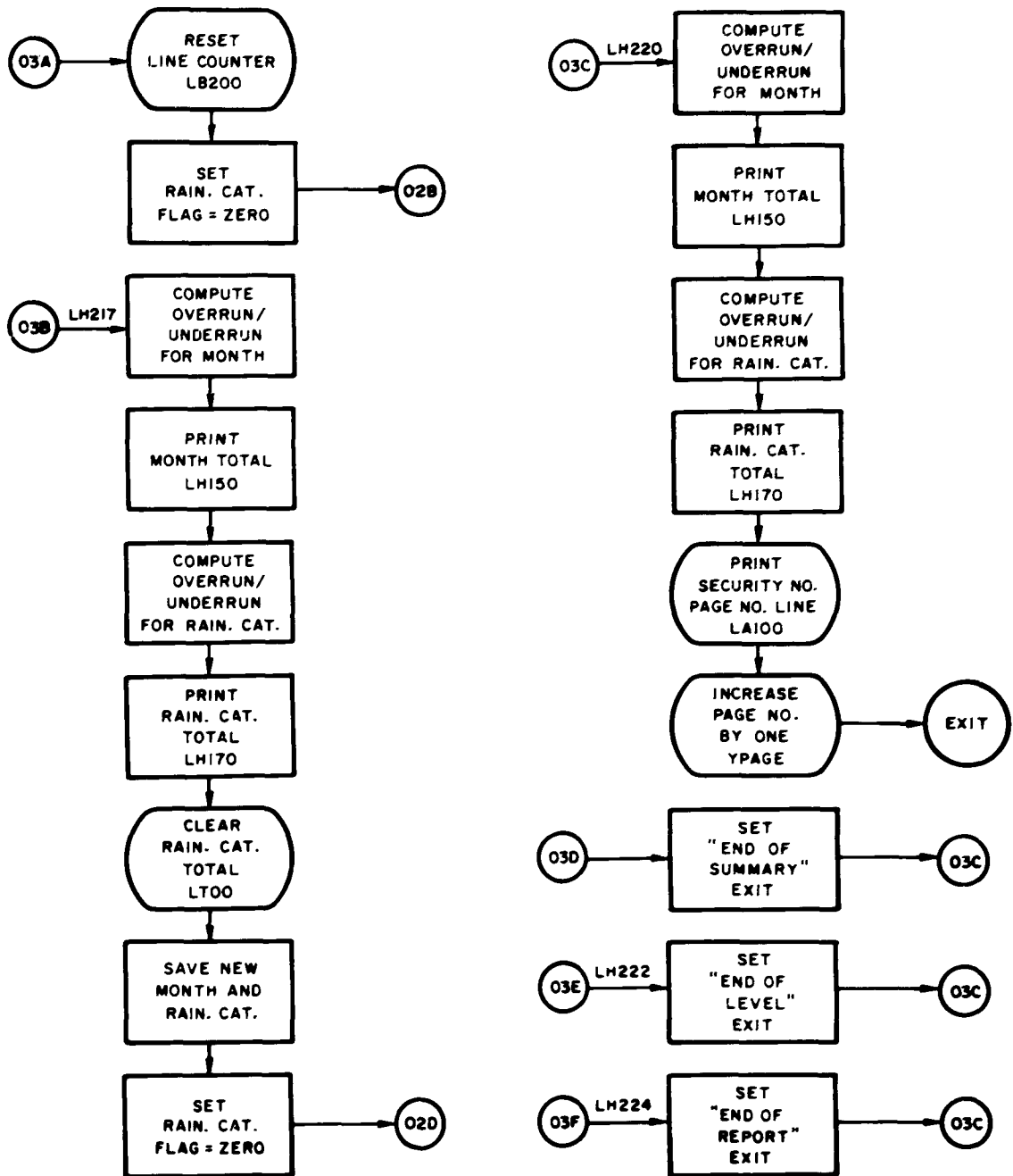
# REGION LH00



REGION LH00  
SUBREGION LH200



REGION LH00  
SUBREGION LH200



Region LK00

**EXPLANATION OF REGION:**

To cumulate data and print Report 60.

**CALLING SEQUENCE:**

L     TSX     LK00, 4

L+1   Normal return

**INPUT:**

Report 60 information from XSORT.

**OUTPUT:**

Report 60 on output print tape.

**STORAGE USED:**

Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

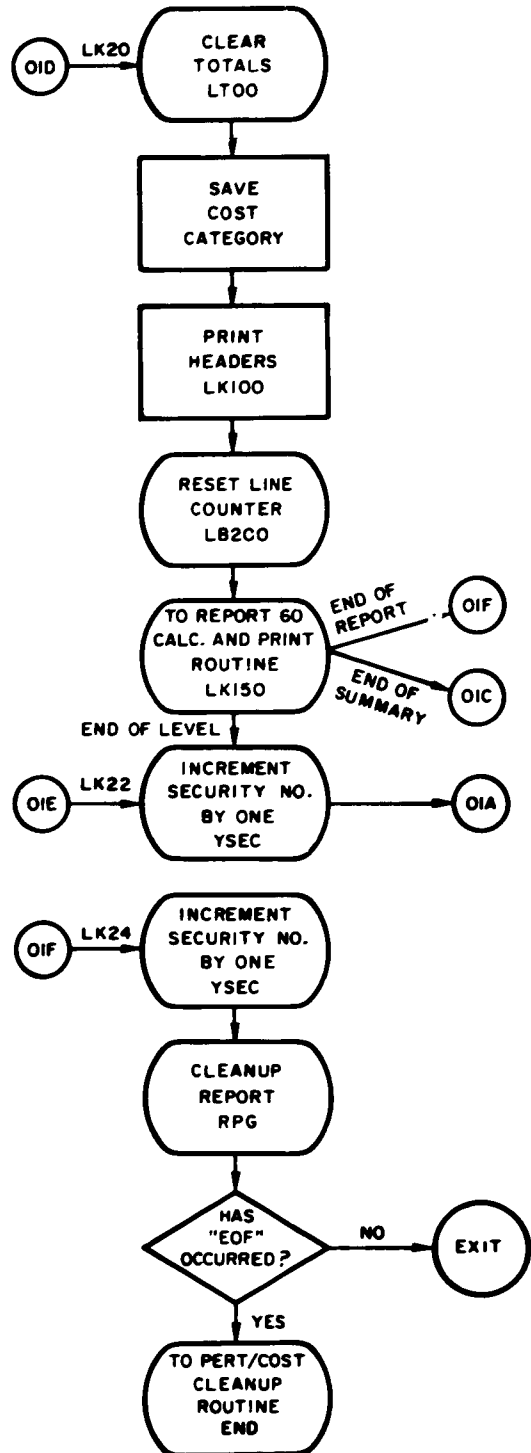
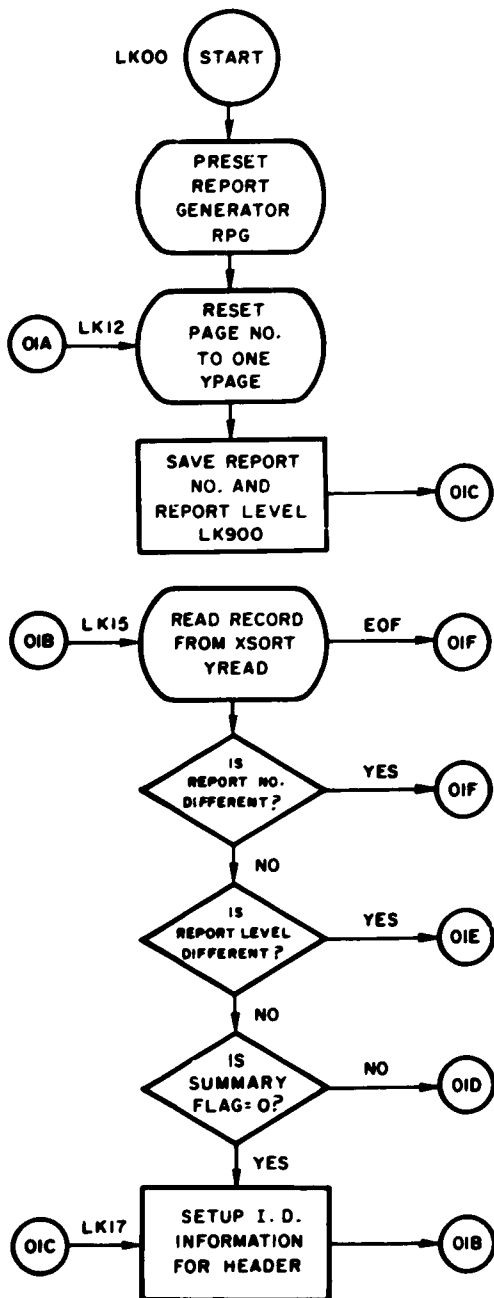
YPAGE     YREAD     LT00

LB200     YSEC     LA100

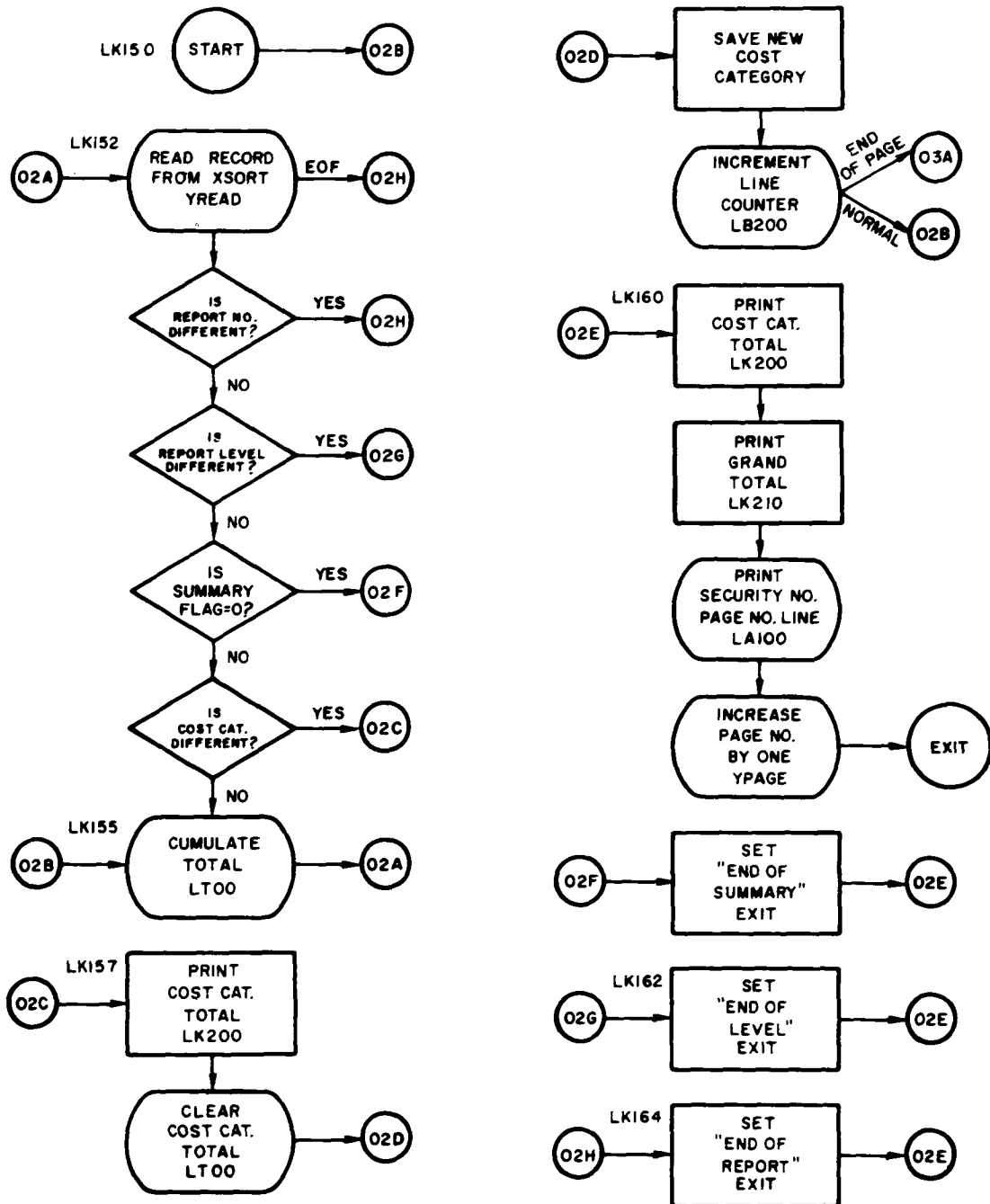
LX00

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.

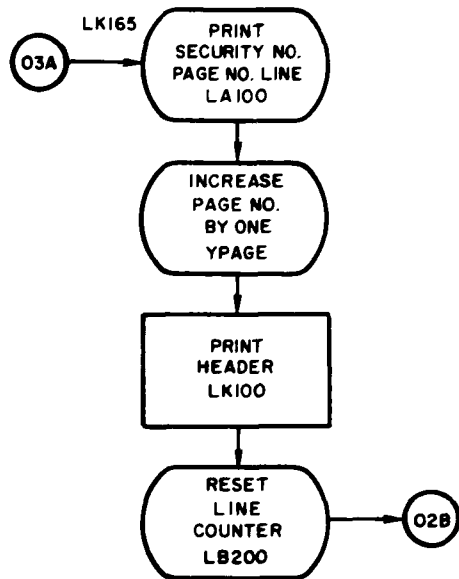


REGION LK00  
SUBREGION LK150



REGION LK00  
SUBREGION LK150

---





Region LM00

EXPLANATION OF REGION:

Setup region for printing Report 80.

CALLING SEQUENCE:

L BX LM00, 4

L+1 Normal return

INPUT:

Report 80 information from XSORT.

OUTPUT:

Report 80 on output report tape.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

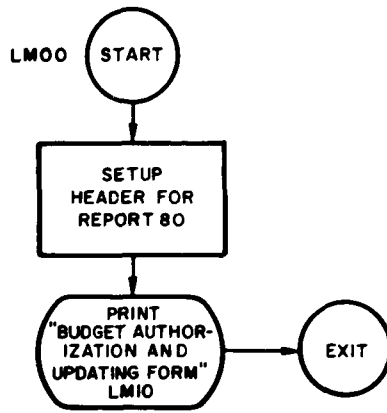
LM10

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION LM00

---



Region LM05

EXPLANATION OF REGION:

Setup region for printing Report 85.

CALLING SEQUENCE:

L TSX LM05, 4

L+1 Normal return

INPUT:

Report 85 information from XSORT.

OUTPUT:

Report 85 on output report tape.

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

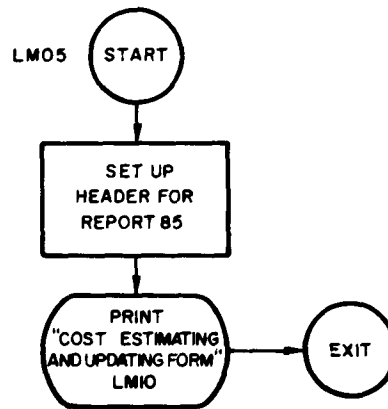
LM10

EXPLANATION OF CALLING SEQUENCE:

Not applicable.

REGION LM05

---



### Region LM10

#### EXPLANATION OF REGION:

To print "Budget Authorization and Updating Form" or "Cost Estimating and Updating Form."

#### CALLING SEQUENCE:

L     TSX    LM10, 4  
L+1   PZE    0, 0, R  
L+2   PZE    A,, B  
L+3   Normal return

#### INPUT:

Information from XSORT routine.

#### OUTPUT:

Report on output print tape.

#### STORAGE USED:

Not applicable.

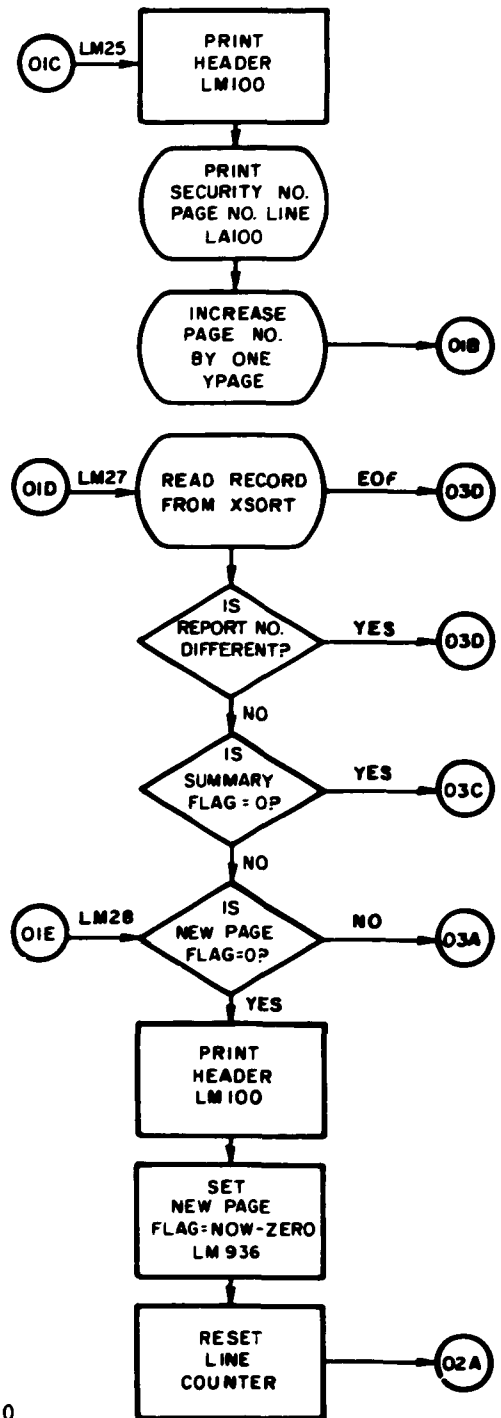
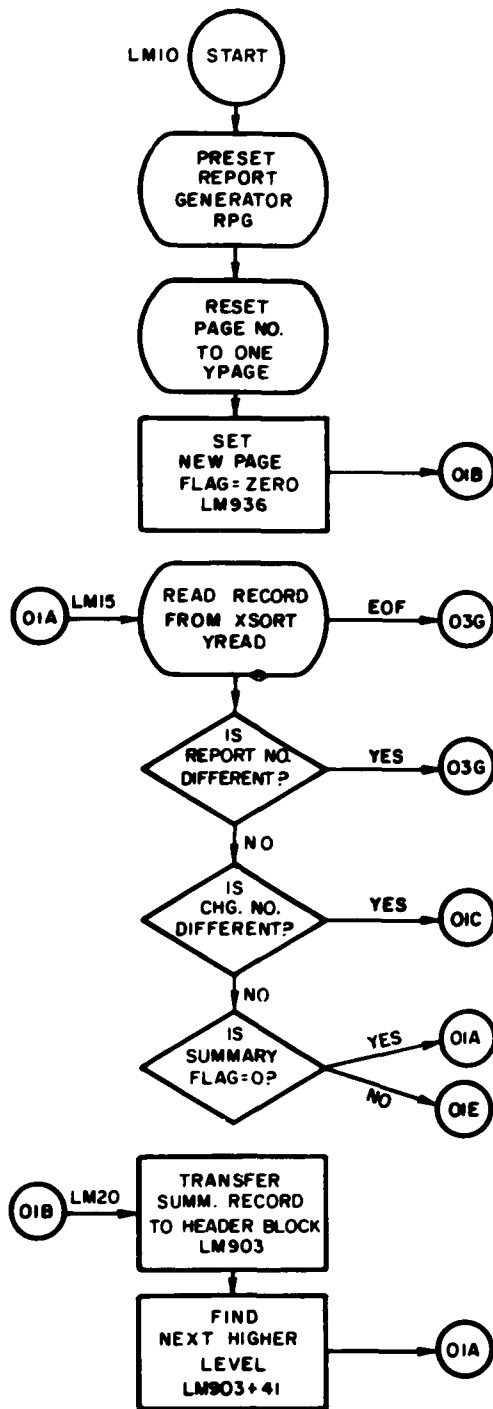
#### SUBREGIONS AND SUBROUTINES USED:

|       |       |       |
|-------|-------|-------|
| YPAGE | YREAD | YCOMP |
| UPCK  | LA100 | YSEC  |

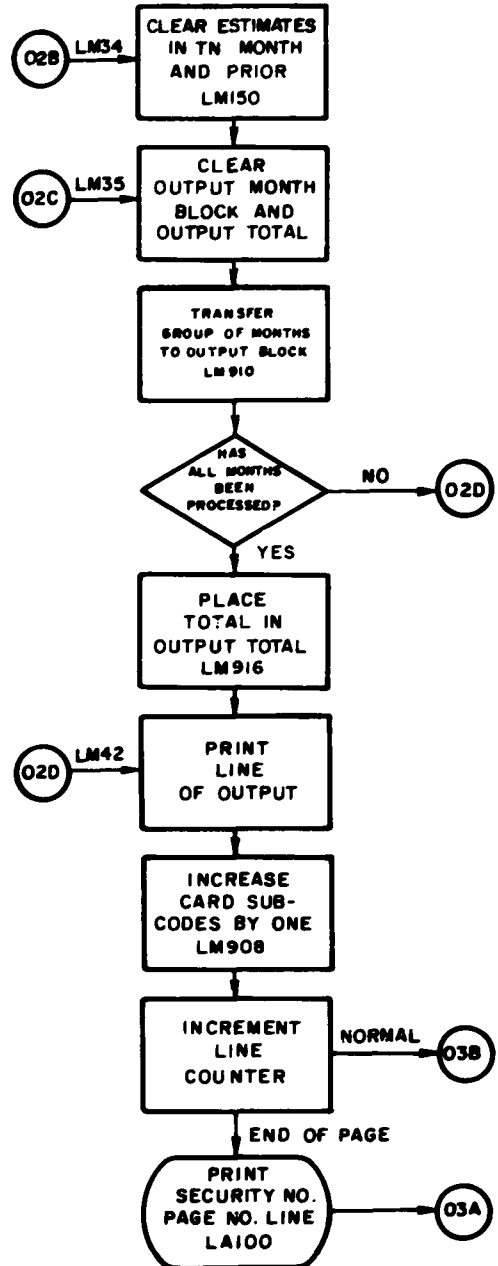
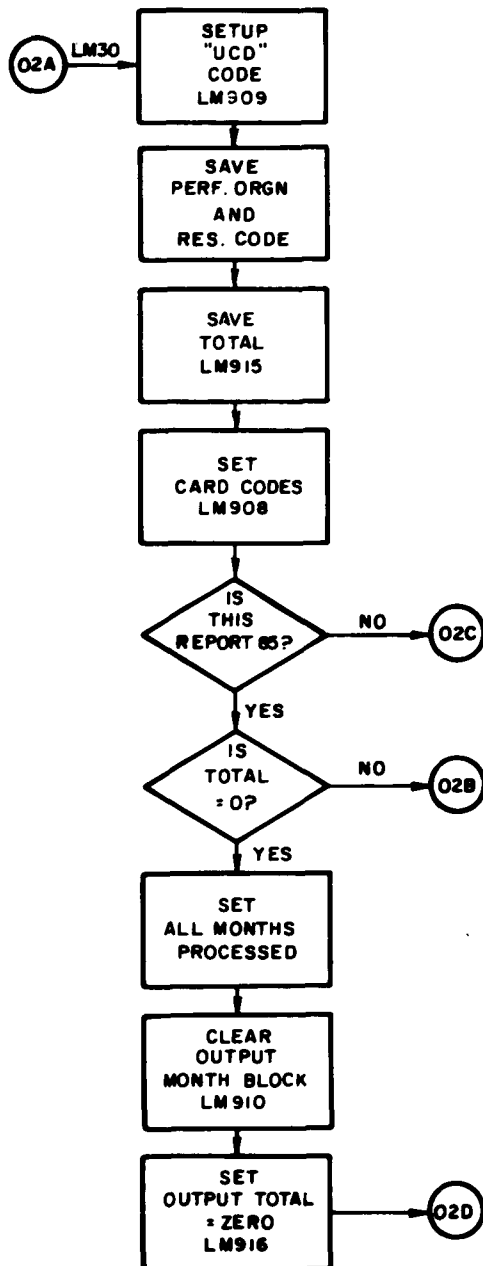
#### EXPLANATION OF CALLING SEQUENCE:

R = report number  
A = location of report name  
B = location of report heading information

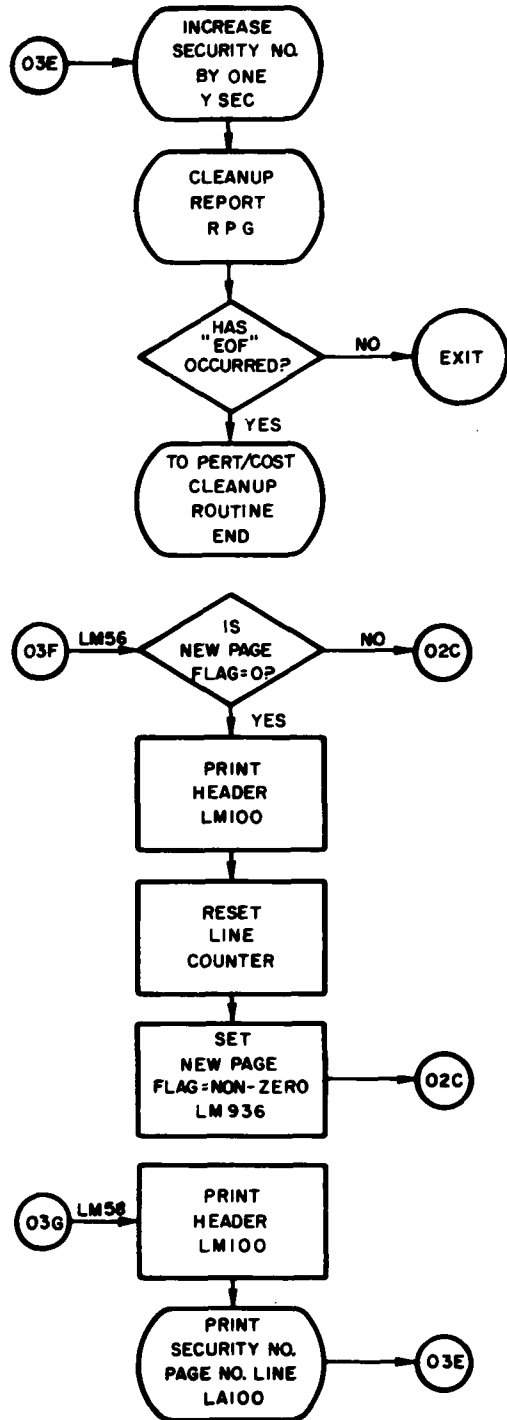
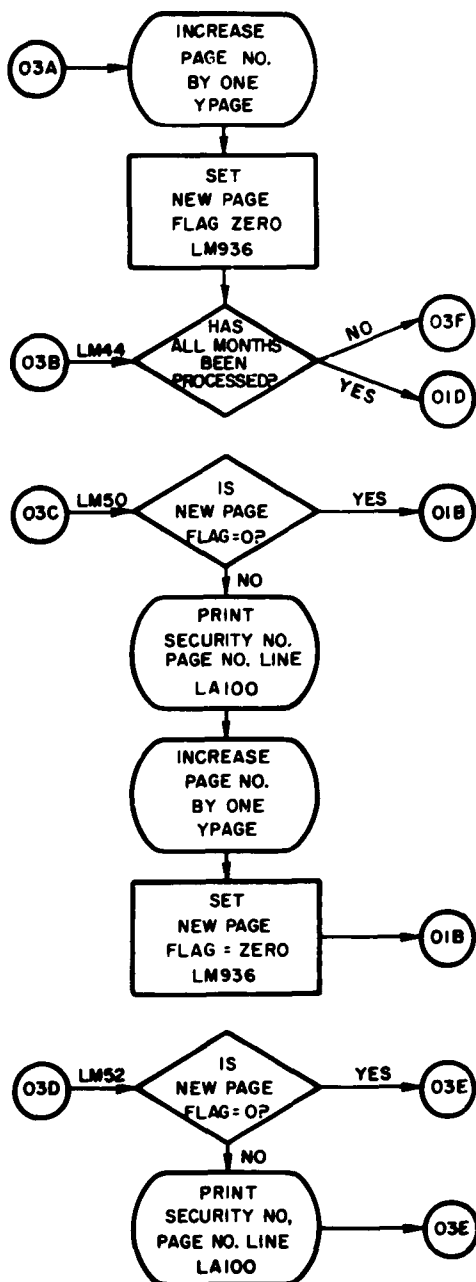
# REGION LM10



REGION LM10



REGION LM10





Region LN00

**EXPLANATION OF REGION:**

To cumulate cost information up work breakdown structure and print Reports 70 and 75.

**CALLING SEQUENCE:**

L    TSX    LN00, 4

L+1   Normal return

**INPUT:**

Report 70 or 75 information from XSORT.

**OUTPUT:**

Report 70 or 75 on output reporting tape.

**STORAGE USED:**

Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

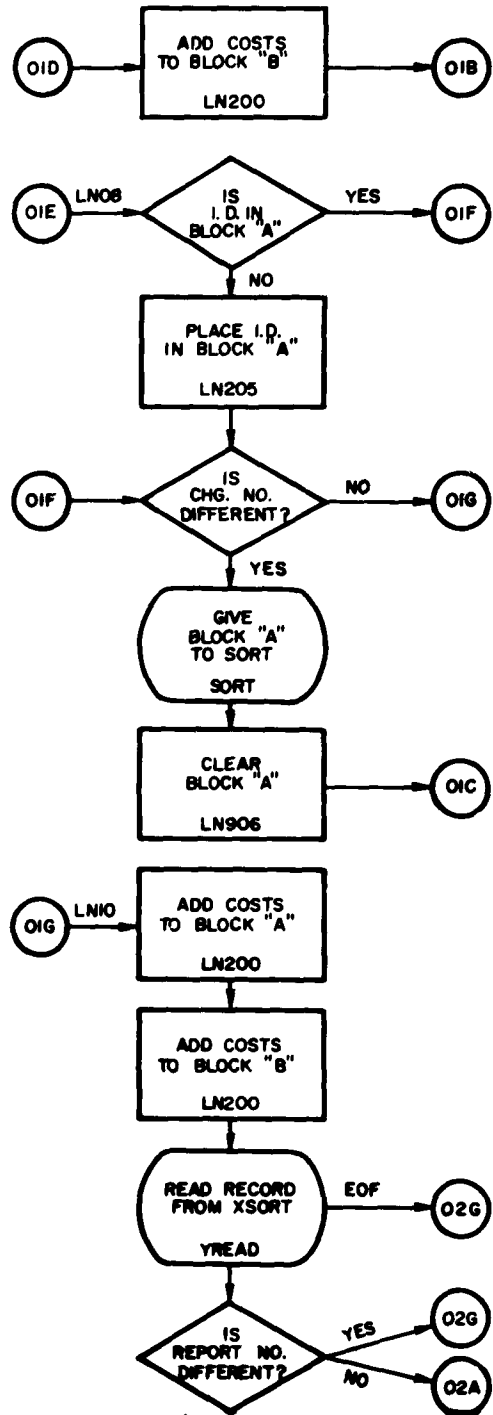
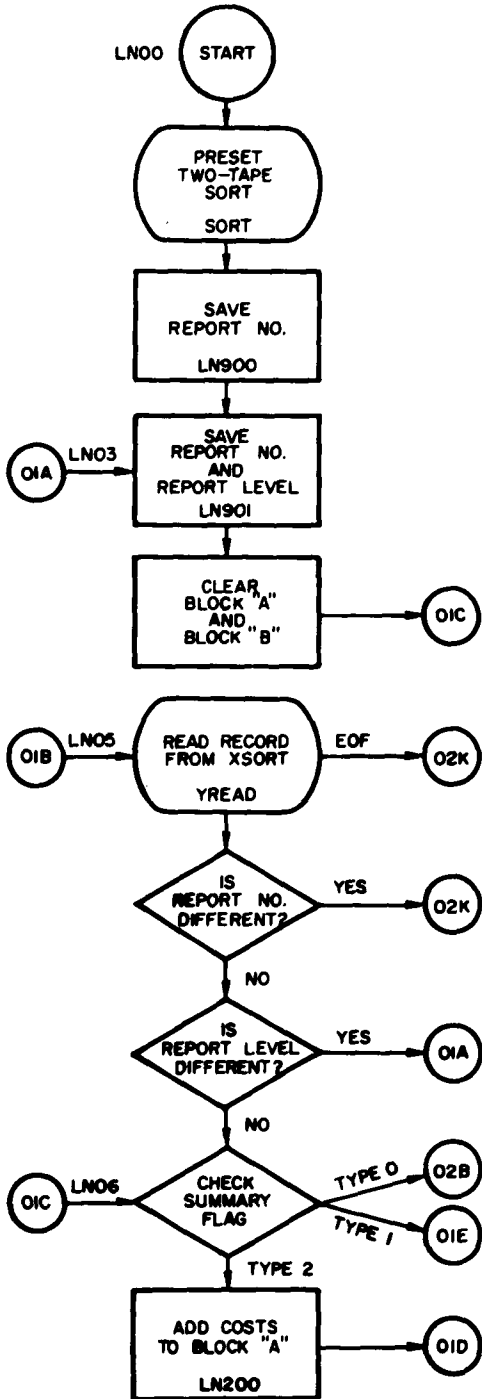
SORT            YREAD            YCOMP

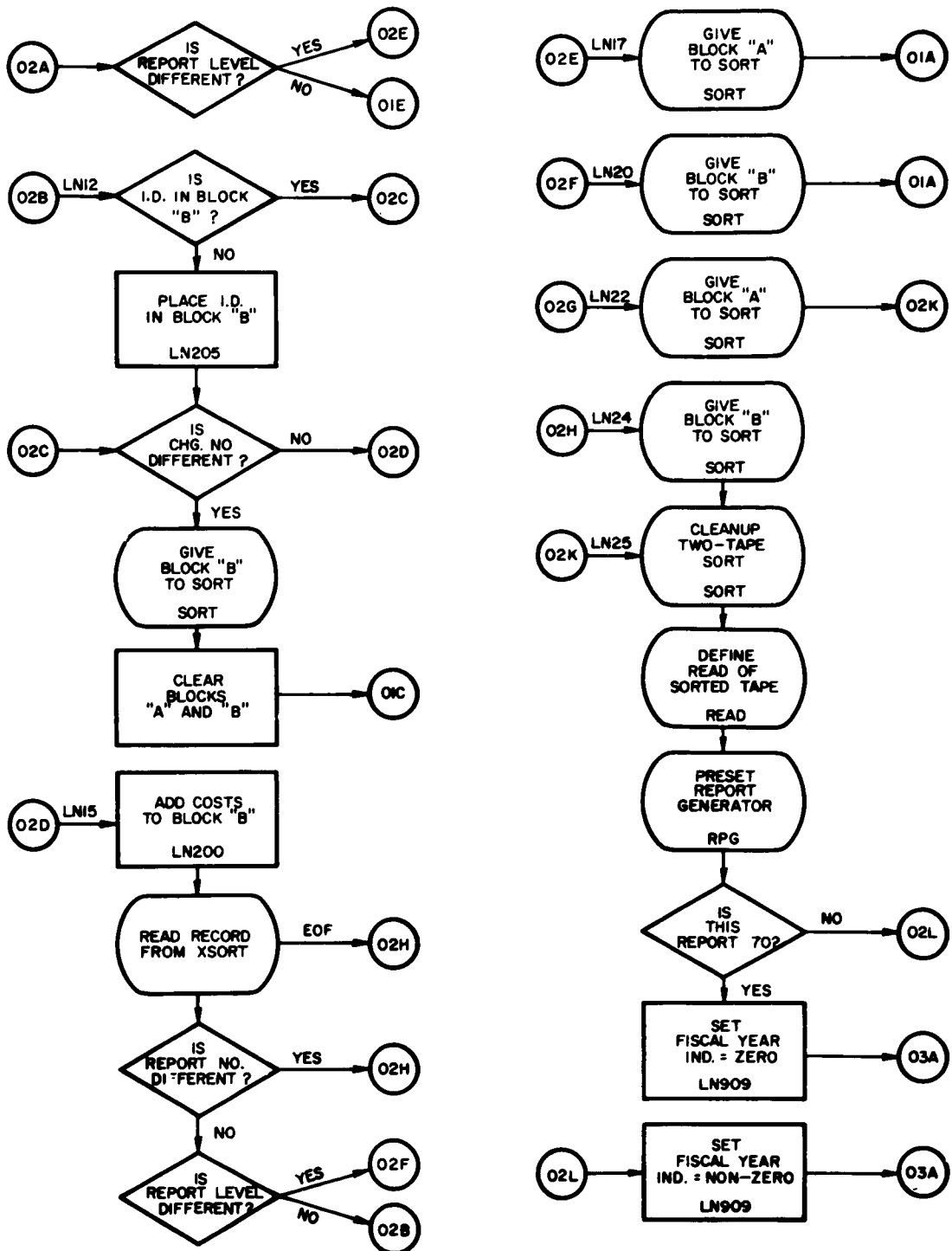
READ            YPAGE            LB200

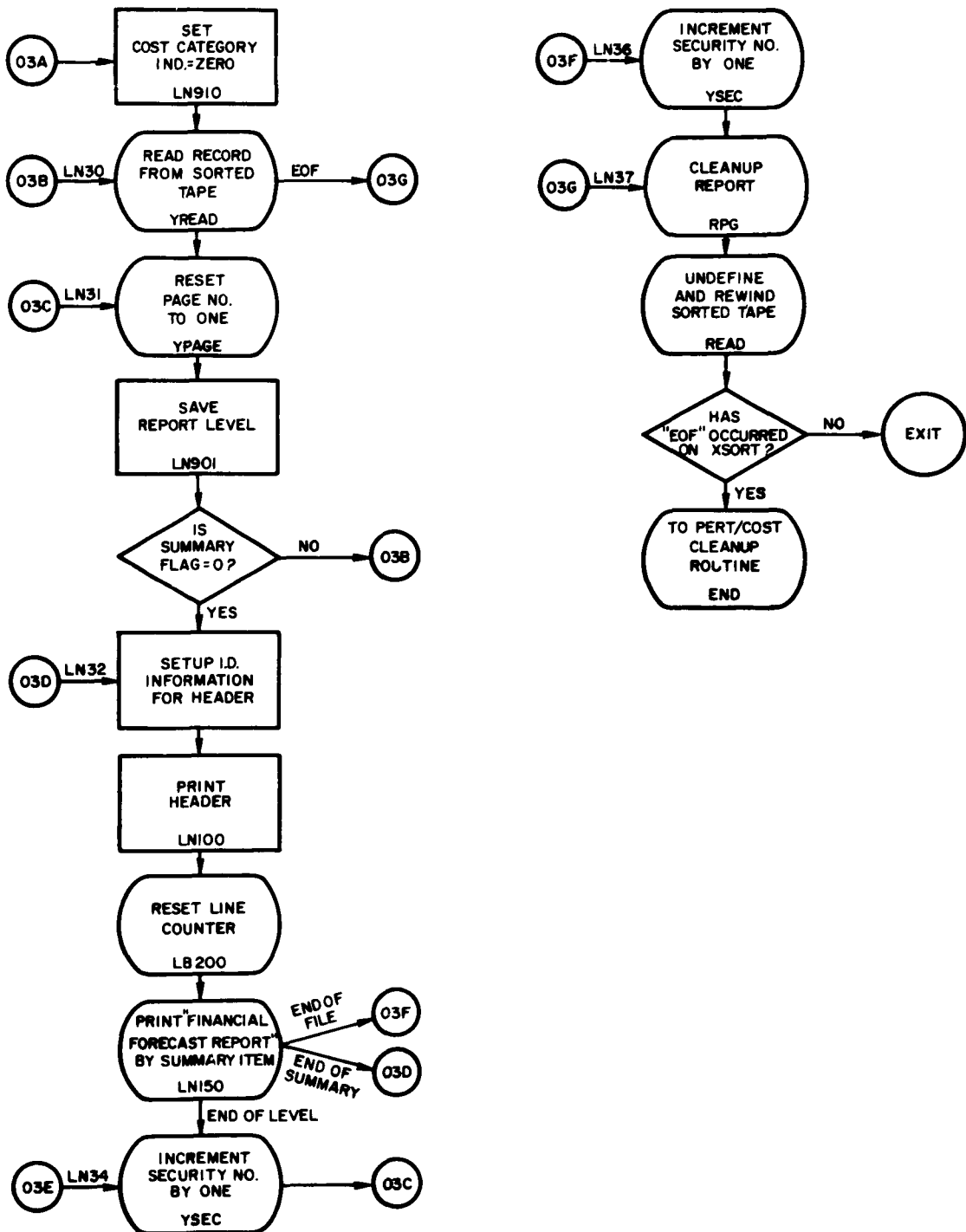
YSEC            LA100            LX00

**EXPLANATION OF CALLING SEQUENCE:**

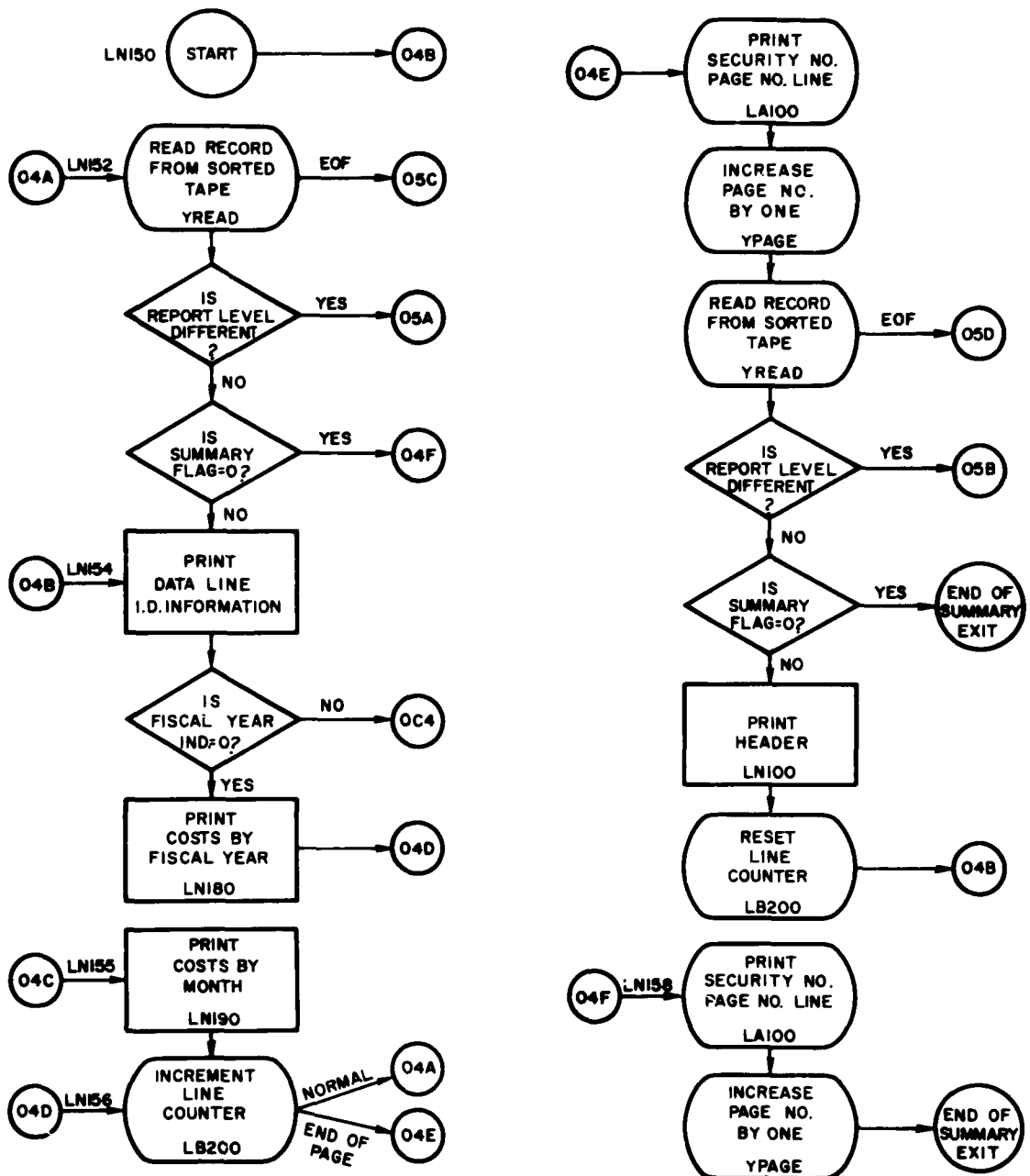
Not applicable.





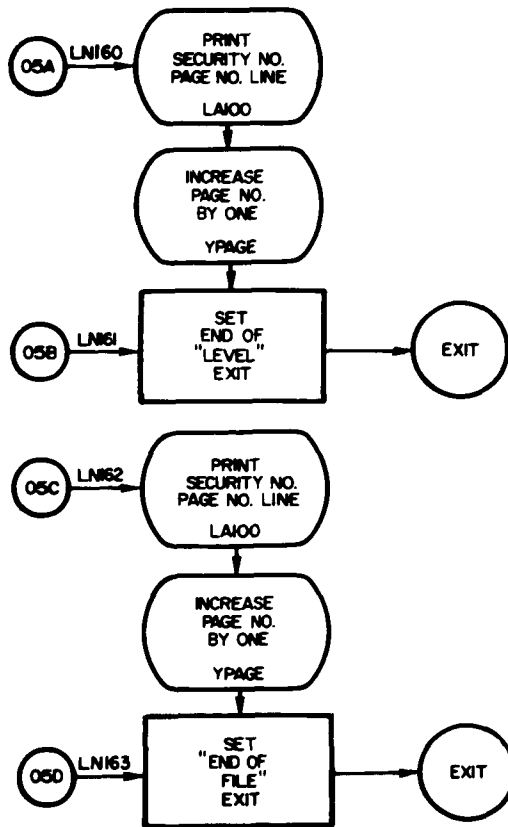


REGION LN00  
SUBREGION LN150



REGION LN00  
SUBREGION LN150

---



Region LP00

**EXPLANATION OF REGION:**

To cumulate cost information by cost category and print Reports 71 and 76.

**CALLING SEQUENCE:**

L TSX LP00, 4

L+1 Normal return

**INPUT:**

Report 71 or 76 information from XSORT.

**OUTPUT:**

Report 71 or 76 on output reporting tape.

**STORAGE USED:**

Not applicable.

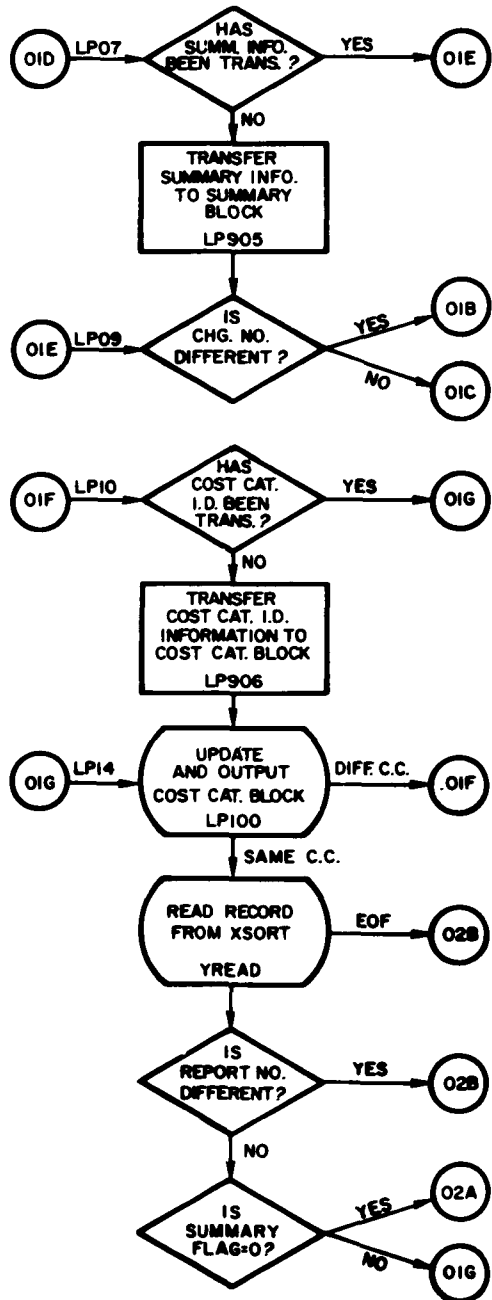
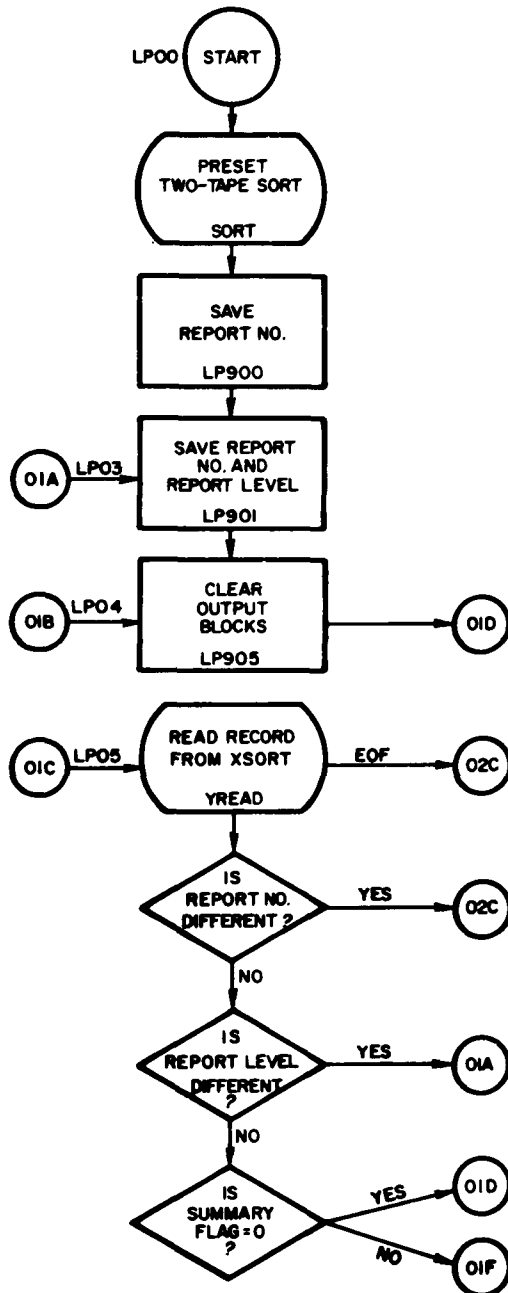
**SUBREGIONS AND SUBROUTINES USED:**

|       |       |       |
|-------|-------|-------|
| SORT  | YREAD | YCOMP |
| READ  | LB200 | YSEC  |
| YPAGE | LA100 |       |

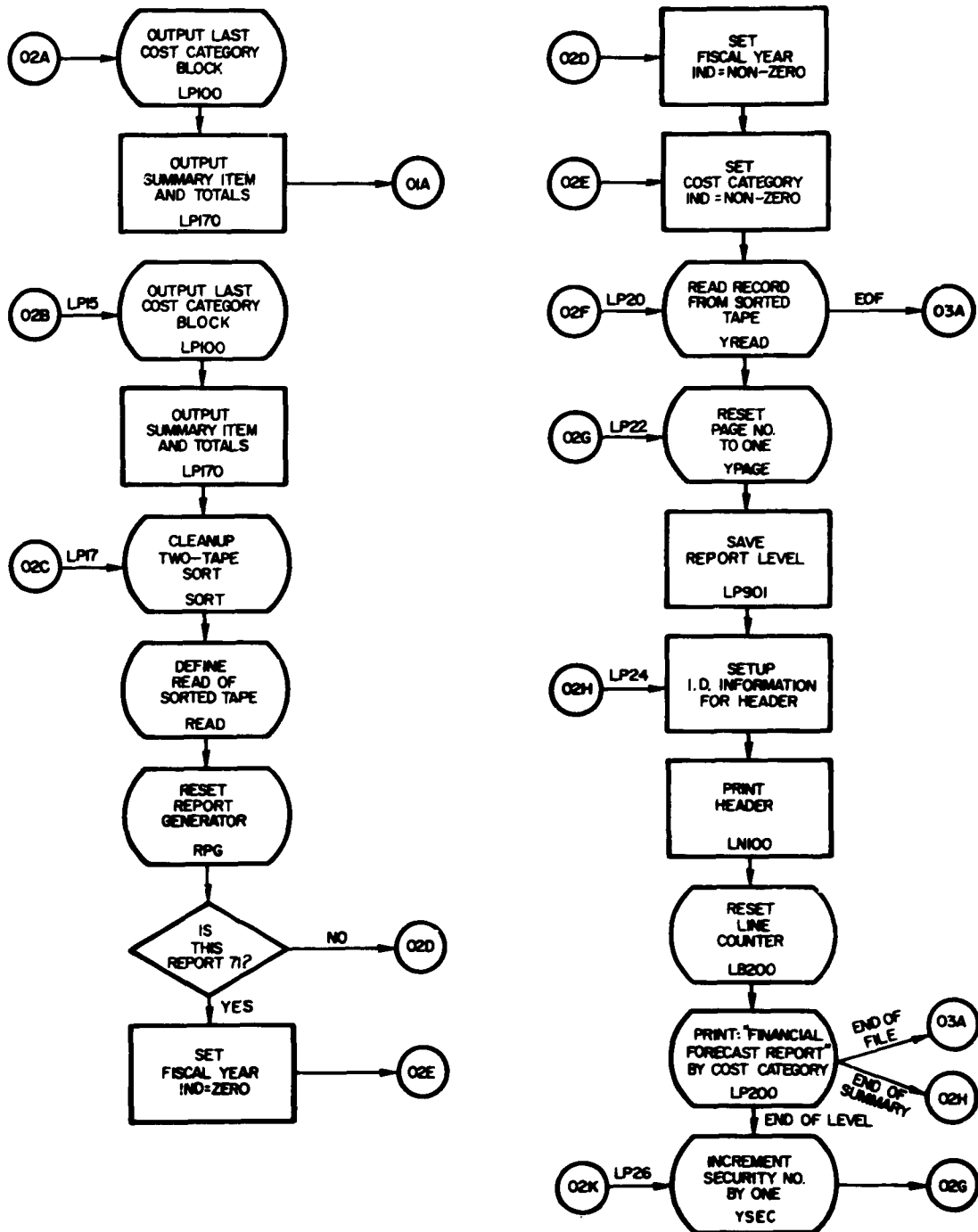
**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.

REGION LP00

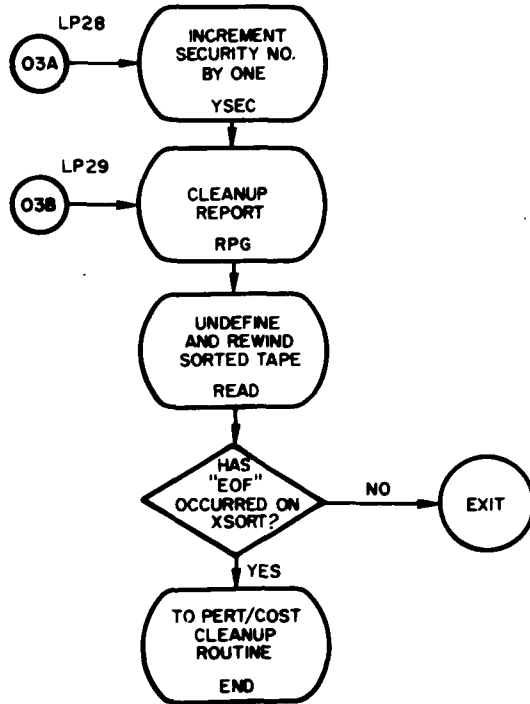




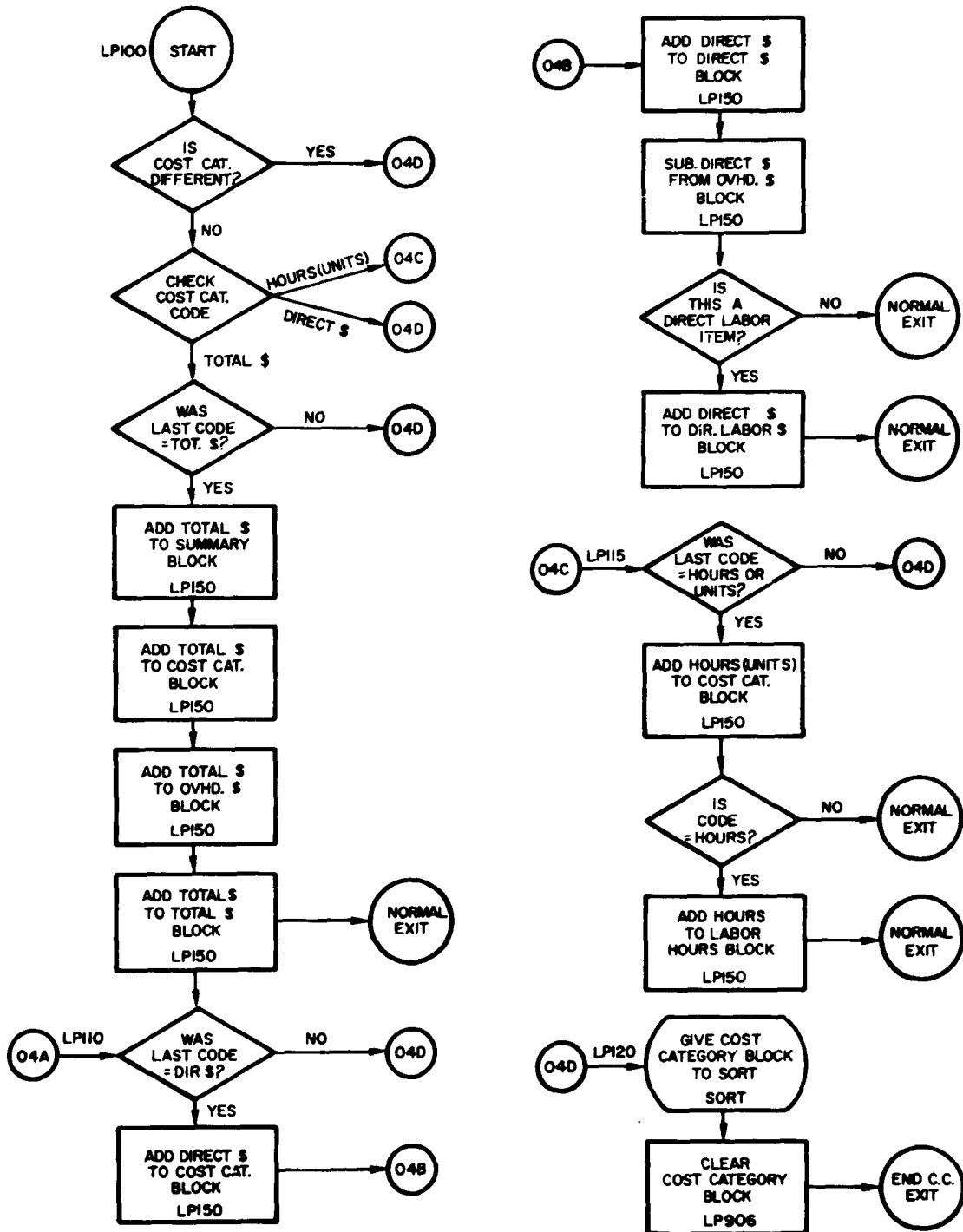


REGION LP00

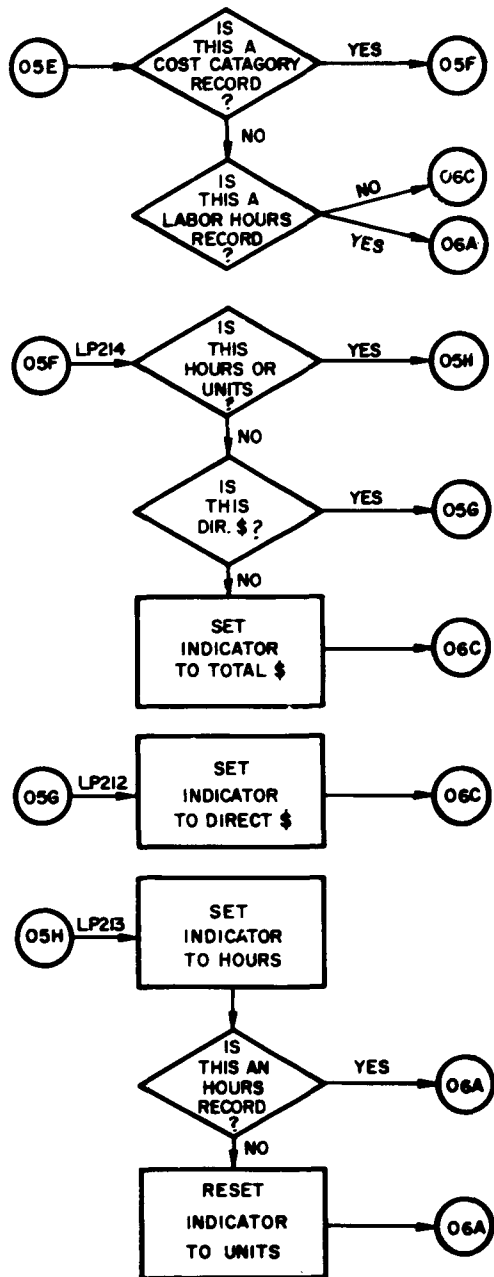
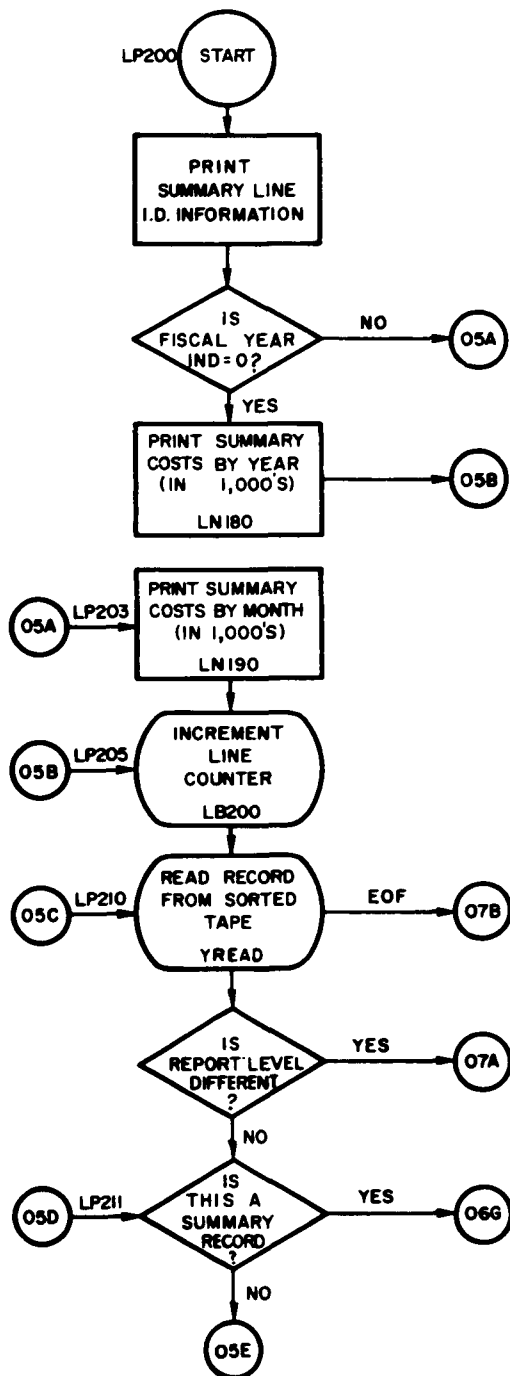
---



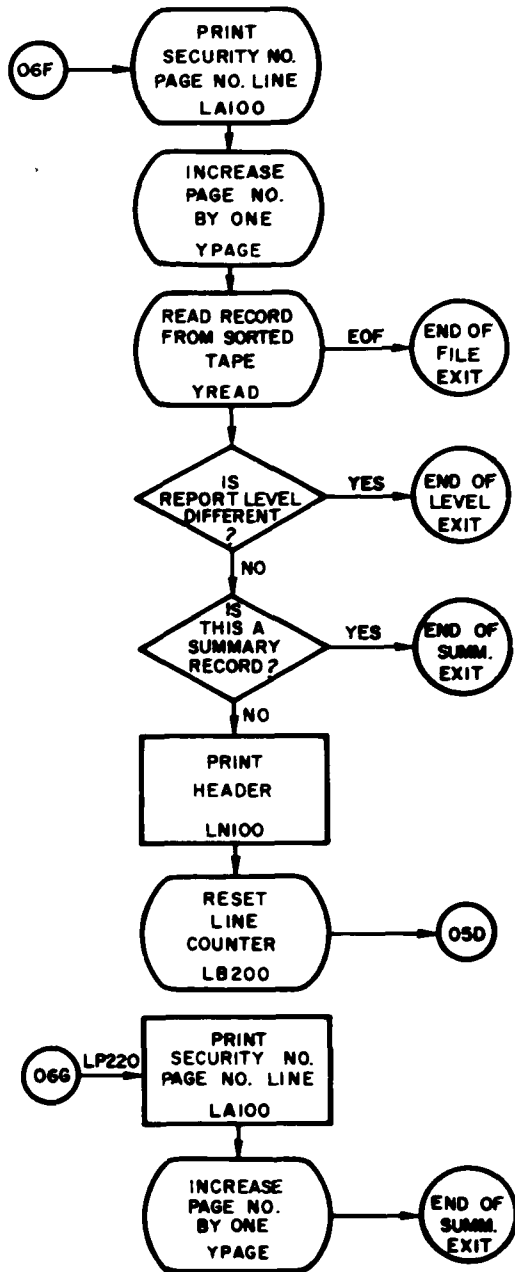
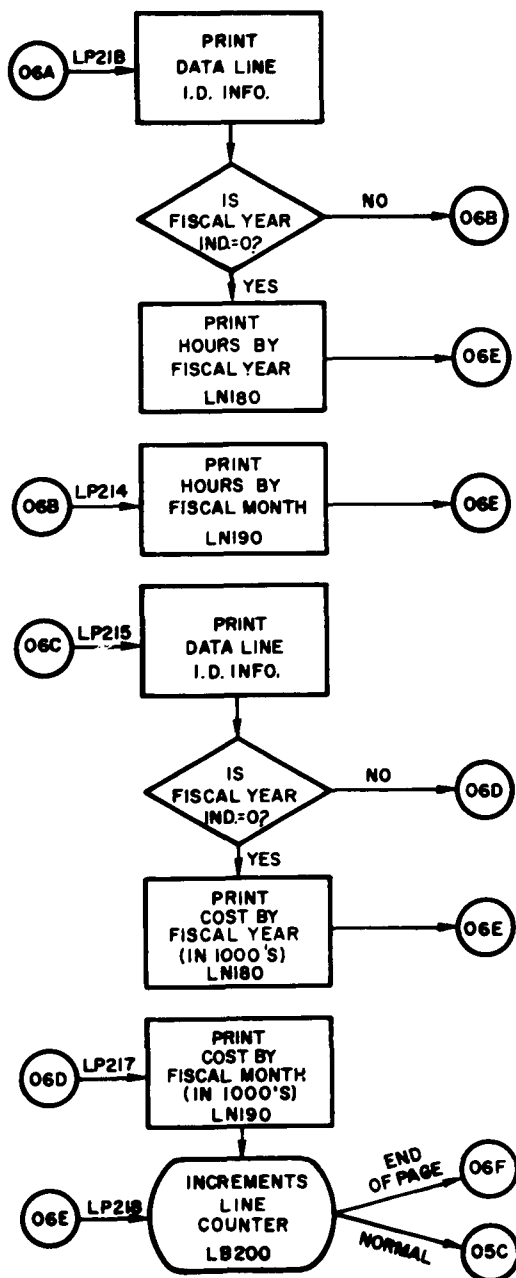
REGION LP00  
SUBREGION LP100



REGION LP00  
SUBREGION LP200

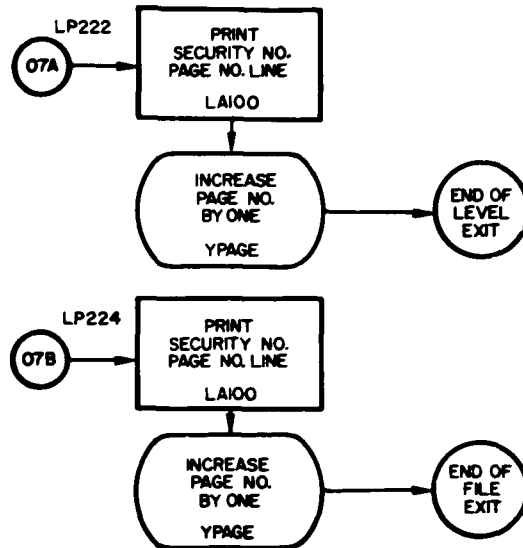


REGION LP00  
SUBREGION LP200



REGION - LPOO  
SUBREGION LP200

---



Region LT00

EXPLANATION OF REGION:

To cumulate four levels of totals.

CALLING SEQUENCE:

L     TSX     LT00, 4  
L+1   PZE     A, 1, N (or MZE L)  
L+2   Normal return

INPUT:

Not applicable.

OUTPUT:

Level 1 totals start in LT901  
Level 2 totals start in LT902  
Level 3 totals start in LT903  
Level 4 totals start in LT904

STORAGE USED:

Not applicable.

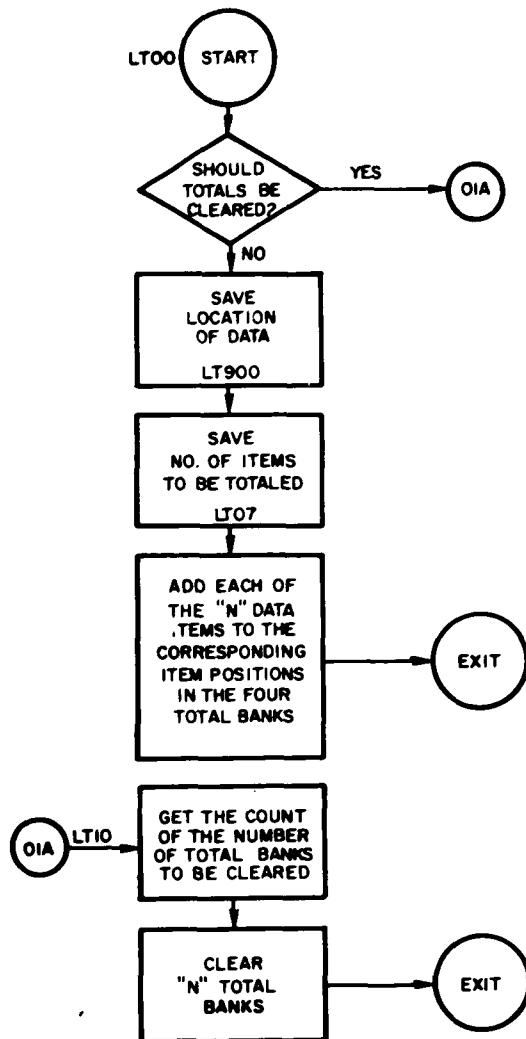
SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

PZE A, 1, N = cumulate totals for N items starting in A, 1  
MZE L        = reset totals on levels 1 thru L to zero

REGION LTOO





Region LX00

**EXPLANATION OF REGION:**

To adjust a dollar amount to the nearest thousands of dollars.

**CALLING SEQUENCE:**

L TSX LX00, 4

L+1 Normal return

**INPUT:**

MQ = dollar amount to be adjusted.

**OUTPUT:**

Accumulator = dollar amount adjusted to the nearest thousands of dollars.

**STORAGE USED:**

Not applicable.

**SUBREGIONS AND SUBROUTINES USED:**

Not applicable.

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable.

## **CHAPTER IV**

### **SUBROUTINES**

## CHAPTER IV

### SUBROUTINES

#### IV-A INTRODUCTION

This section will explain the subroutines that are used in the PERT Cost Program. These subroutines can be used in any one of the four program phases, or in all of them. The topical subsections are listed below with the corresponding page references.

|                                        |         |
|----------------------------------------|---------|
| IV-B Report Generator . . . . .        | IV-B-1  |
| Purpose . . . . .                      | IV-B-1  |
| Description . . . . .                  | IV-B-1  |
| Usage. . . . .                         | IV-B-1  |
| Storage Requirements . . . . .         | IV-B-6  |
| Buffer Pool Concert . . . . .          | IV-B-6  |
| Tape Switching. . . . .                | IV-B-7  |
| Tape Errors . . . . .                  | IV-B-7  |
| Programmer Errors. . . . .             | IV-B-7  |
| Paging and Titling . . . . .           | IV-B-8  |
| Use of REPEAT Macro . . . . .          | IV-B-9  |
| Editing . . . . .                      | IV-B-11 |
| Macro-Instruction Expansions . . . . . | IV-B-13 |
| IV-C Four-Tape Sort Routine. . . . .   | IV-C-1  |
| Definition . . . . .                   | IV-C-1  |
| Procedure. . . . .                     | IV-C-1  |
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## IV-B REPORT GENERATOR

### Purpose

This subroutine sets up and controls the printing of the output for a report generating program.

### Description

The subroutine, by means of macro-instructions, enables the programmer to handle all the print output associated with any amount of information processing. Specifically, it facilitates the setting up of print fields, lines or paragraphs for specific reports and, if desired, provides for automatic paging and titling. Also, if page dimensions are specified, the printing may be done on any non-standard page and/or in any desired format.

### Usage

#### (a) Initialization Macros

These macros provide for initial definitions and need only be given once for all the reports that are to be considered.

#### BUCKET L1, L2

This macro makes available to the subroutine the block of storage from L1 to L2 inclusive. If n reports are to be processed, the number of words per block should be at least

$$\sum_{i=1}^n M_i \left( N_i + \frac{2}{3} \right) \quad (i=1, 2, \dots, n)$$

where  $M_i$  = no. lines per page for report  $i$

$N_i$  = no. words per line for report  $i$

The use of this macro is mandatory.

FILDEF  $T_{11}, T_{12}, T_{21}, \dots, T_{62}$

This macro defines the symbolic tapes that constitute a logical file. The tapes  $T_{ij}$  are defined as the symbolic address of the IOEX tape address. Two tapes  $T_{i1}, T_{i2}$  may be attached to a given file  $i$  and as many as six files may be defined. The first two parameters in the macro define file number 1, the second two define file 2, etc. The use of this macro is mandatory.

ATTACH  $K, F$

This macro assigns report number  $K$  to file number  $F$ :  
 $1 \leq K \leq 20, 1 \leq F \leq 6$ . Any number of reports may be attached to one file. The use of this macro is mandatory, but it may be given at any time prior to the use of any page description or line generating macros. The FILDEF macro defining file  $F$  must be given prior to the ATTACH macro.

(b) Page Description Macros

These macros specify the page dimensions, title lines and basic information associated with a particular report.

PAGDEF  $P, N, L_0, L, K$

This macro defines the page dimensions for a particular report  $K$  and need only be given once for each report.

$0 \leq P \leq 131$  = no. of blank characters to the left of each line.

$1 \leq N \leq 132$  = no. of characters per line.

$0 \leq L_0 \leq 59$  = no. of blank lines before line 1.

$1 \leq L \leq 60$  = no. of lines per page.

The page dimensions are with respect to a standard page of 60 lines with 120 characters per line (13 1/2 inch  $\times$  11 inch sheet). If PAGDEF is not given, the standard page will be assumed; i. e.,  $P = 0, N = 120, L_0 = 0, L = 60$ .

In the later descriptions of DATPAG, TITLES, LINE, FIELD, EDIT and PARAG, the references to print position and line number will take into account  $P$  and  $L_0$ ; i. e.,

A specified print position  $P_i$  will correspond to actual print wheel  $P_i + P$ .

A specified line number  $L_i$  will correspond to actual line number  $L_i + L_0$ .

DATPAG  $L_d$ ,  $P_d$ , K

This macro specifies where on each page of a particular report K the date and page number will be printed:

$L_d$  = line ( $L_d = 0$ , indicates first line;  $L_d \neq 0$ , indicates last line)

$P_d$  = print position

The date and page consists of 24 characters, as in the following example:

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | A | Y | 2 | 7 | , | 1 | 9 | 6 | 0 | P | A | G | E | K | K | - | X | X | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

where KK = report number, XXX = page number.

If DATPAG is not given, no date and page line will be printed.

TITLES Y, T,  $N_t$ , K

This macro establishes a set of titles to be printed at the beginning of each page of a particular report K.  $N_t$  words from (Y, T) will be stored in the appropriate print images beginning with print position 1 of line 1 as defined by PAGDEF and continuing for as many lines as are implied by  $N_t$  words. If DATPAG has also been given for line 1, the titles will begin on line 2. Each succeeding line in the titles will be single space. This macro need only be given once but may be given at any time for the purpose of changing titles. However, since the subroutine does not save the titles, they must remain intact at (Y, T) for the duration of the report.

(c) The Report Identification Macro

REPORT K, T

This macro must be given at the beginning of any sequence of line-generating macros. If T = 0, K represents the report number to be associated with the printing described by the succeeding macros.



If  $T \neq 0$ , the report number is in the address portion of the word in (K, T).

If the report number is zero, the printing will be associated with the most recently specified report.

(d) Line-Generating Macros

These macros set up any field, line, or paragraph associated with a particular report. Any sequence of line-generating macros must be immediately preceded by a REPORT macro and terminated by an ENDFLD macro. No other coding may be interspersed in the sequence.

**SPACER N**

This macro indicates that a new line or part of a line is to start. N specifies the number of line spaces before printing the next line.

N = 0 (or blank) indicates space suppress

= 1 indicates single space

= 2 double space

.

= 60 indicates space 60 lines

See Page IV-B-8 for exceptions. If no SPACER has been given, it will be assumed that subsequent macros refer to the current line.

**LINE N**

This macro indicates on which line the output specified by subsequent macros is to be printed. N represents the line number ( $1 \leq N \leq 60$ ). See Page IV-B-8 for exceptions.

**FIELD Y, T, E, P<sub>f</sub>, I<sub>p</sub>**

This macro picks up E characters, beginning with the Cth character of the word in (L, T), and stores them in the appropriate print image beginning at print position P<sub>f</sub>. The word in (Y, T) has the form:

(Y, T) XXX L, T, I<sub>L</sub>

where

XXX = C = PZE for 1st character  
= PON for 2nd character  
= PTW for 3rd character  
= PTH for 4th character  
= FOR for 5th character  
= FVE for 6th character

$I_p$  is the print position incrementer, and  $I_L$  is the location incrementer used in conjunction with the REPEAT macro.

PARAG Y, T, N

This macro picks up N words beginning with the word in (L, T) and stores them in as many lines as are implied by N words. The first character will be stored in the first print position of the current line and all succeeding lines of the paragraph will be single space. The word in (Y, T) has the form:

(Y, T) PZE L, T

REPEAT N, M

This macro executes the next N macros M times. No more than two levels of REPEAT are permitted, see Page IV-B-10.

EDIT Y, T,  $P_f$ , C, E, B,  $I_p$

This macro "edits" the quantity in L, T and stores it in the appropriate image beginning with print position  $P_f$ .

C=0 for signed BCD input (no conversion required)

C=1 for fixed point binary input

C=3 for unsigned BCD input

$0 \leq B \leq 35$ ; binary point of input (fixed point input)

E = no. of BCD characters in input quantity (including sign if C = 0).

The word in (Y, T) has the form.

(Y, T) PZE L, T,  $I_L$

$I_p$  is the print position incrementer, and  $I_L$  is the location incrementer used in conjunction with the REPEAT macro.

For BCD input the sign will appear as a BCD character in the first character position of the word in (L, T); i. e.,  $+ = 20_8$ ,  $- = 40_8$ .

For binary input, one more than the specified number of fractional digits is generated and the quantity is rounded if this digit is greater than 5.

The format of the output is described by a sequence of no more than 24 BCD characters beginning with the first character in (Y, T+1), where each character corresponds to a potential print position (i. e., the first character corresponds to print position  $P_f$ ), see Page IV-B-11.

#### ENDFLD

This macro indicates the termination of a series of line generating macros referring to one report.

#### (e) Report Termination Macro

WRAPUP K

This macro completes all remaining lines for report K. If  $K = 0$ , all remaining reports are completed.

#### (f) File Termination Macro

CLOSEF F

This macro closes file F by writing an end-of-file mark and rewinding the tape. If  $F = 0$ , all open files are closed.

### Storage Requirements

The subroutine itself occupies a total of 2000 cells but requires an auxiliary storage capable of retaining at least one page for each report that is to be processed. This storage is assigned by the programmer with the use of the BUCKET macro.

### Buffer Pool Concept

The storage assigned by the BUCKET macro is divided into blocks of 103 words each capable of retaining five 132 character lines together with their carriage control characters and record marks. An additional word is reserved for a block-availability indication. The output for a particular report is then accumulated in grouped records containing no more than five

lines. When a block has been filled and a new record is to start, the next available block is called for from the pool and the old block is set to "unavailable." When enough such records have been formed to comprise a page of printing they are put out on the specified tape. After the tape has been checked, the blocks are made available again and released to the pool. Thus priorities for reports are handled automatically and depend only on their frequency of occurrence.

Note: The grouped record procedure assures a saving in tape time but requires the use of a Model 720, 730, or a Model 1403 printer.

#### Tape Switching

When an end-of-tape has been encountered during writing, an "end-of-file" message and a "rewind and unload" message are given. The following note is then written on-line:

TAPE XXXX MAY NOW BE REMOVED FOR PRINTING  
AND REPLACED WITH A BLANK TAPE

where XXXX is the tape address in octal. At this time the alternate tape of the file specified by the FILDEF macro will be rewound and used from then on as the primary output tape of the file. If no alternate tape has been specified, the subroutine will continue using the primary tape unit after a new tape reel has been mounted.

#### Tape Errors

If an unrecoverable redundancy error has occurred during writing, the following note is written on-line and the program will halt.

TAPE XXXX IS CAUSING REDUNDANCIES DURING WRITE.  
CONTROL RETURNED TO SYSTEM.

#### Programmer Errors

The following errors are detected by the subroutines and corresponding notes printed off-line. Where applicable, the program will halt.

- (a) LOC. XXXXX REPORT XX. LINE MACRO PARAMETER EXCEEDS MAX. LINES PER PAGE. SUBSEQUENT INFORMATION WILL BE PRINTED ON NEXT LINE.
- (b) LOC. XXXXX REPORT XX. NO FILE ASSIGNED. RETURNED TO SYSTEM.
- (c) LOC. XXXXX REPORT XX. NO TAPE ASSIGNED TO FILE. RETURNED TO SYSTEM.
- (d) LOC. XXXXX REPORT XX. ILLEGAL CHARACTER IN EDIT FORMAT. RETURNED TO SYSTEM.
- (e) LOC. XXXXX REPORT XX. NOT ENOUGH BUFFER SPACE ASSIGNED. RETURNED TO SYSTEM.
- (f) LOC. XXXXX REPORT XX. ILLEGAL REPORT NUMBER. RETURNED TO SYSTEM.
- (g) LOC. XXXXX REPORT XX. ILLEGAL MACRO. PROBABLY NO ENDFLD. RETURNED TO SYSTEM.

#### Paging and Titling

The subroutine maintains a current line count for each page of a report and, if specified, will perform automatic page restoring together with title and page identification printing without programmer interference. This feature will be operative if and only if any of the page description macros have been given; otherwise it will be assumed that paging is under programmer control. The various conditions of spacing and page restoring in the automatic mode are described below where

$L_{\max}$  = specified number of lines per page

$L_{\text{curr}}$  = current line number

$L$  = LINE macro parameter

$N$  = SPACER macro parameter

#### (a) Using LINE Macro

If  $L_{\max} > L > L_{\text{curr}}$  the next line will be printed on line  $L$  this page.

If  $L \leq L_{\text{curr}}$  the next line will be printed on line  $L$  next page.

If  $L > L_{\max}$  the next line will be printed on line  $L_{\text{curr}} + 1$  this page, but an error condition will be recorded.

(b) Using SPACER Macro

If  $L_{\text{curr}} + N < L_{\max}$  the next line will be printed on line  $L_{\text{curr}} + N$  this page.

For the conditions  $L_{\text{curr}} + N \geq L_{\max}$ , the location of the next line will depend upon whether or not any titles or date-page lines have been specified. The various possibilities under these constraints may be summarized as follows:

| DATPAG On<br>1st Line ? | DATPAG On<br>Last Line ? | Titles<br>? | Next Line If<br>$L_{\text{curr}} + N = L_{\max}$ | Next Line If<br>$L_{\text{curr}} + N > L_{\max}$ |
|-------------------------|--------------------------|-------------|--------------------------------------------------|--------------------------------------------------|
| No                      | No                       | No          | $L_{\max}$ this page                             | Line 1 next page                                 |
| No                      | No                       | Yes         | $L_{\max}$ this page                             | 2 lines after last<br>title line next<br>page    |
| No                      | Yes                      | No          | Line 1 next page                                 | Line 1 next page                                 |
| No                      | Yes                      | Yes         | 2 lines after last<br>title line next<br>page    | 2 lines after last<br>title line next<br>page    |
| Yes                     | No                       | No          | $L_{\max}$ this page                             | Line 2 next page                                 |
| Yes                     | No                       | Yes         | $L_{\max}$ this page                             | 2 lines after last<br>title line next<br>page    |

Use of REPEAT Macro

(a) One-Level REPEAT:

REPORT

|        |      |
|--------|------|
| REPEAT | 2, 3 |
| SPACER | 1    |
| FIELD  |      |

```

[REPEAT 5, 4
 FIELD
 FIELD
 FIELD
 EDIT
 FIELD
ENDFLD

```

(b) Two-Level REPEAT:

```

REPORT
[REPEAT 7, 50
 SPACER 1
 FIELD
 [REPEAT 1, 5
 EDIT
 [REPEAT 2, 3
 EDIT
 FIELD
]
]
ENDFLD

```

For each FIELD or EDIT macro appearing within the range of a REPEAT (either one- or two-level), the base location  $L, T$  will be incremented by  $I_L(k-1)$  to form a new base location  $L, T + I_L(k-1)$  every time the macro is encountered. Here  $k$  is the number of times the macro has been encountered and  $I_L$  is the location incrementer. Also, the base print position  $P_f$  will be incremented by  $I_p(k-1)$  to form a new print position  $P_f + I_p(k-1)$  every time the macro is encountered. However, at the completion of a REPEAT, the incrementer is reset to zero so that the next time the macro is executed, the print position will be the original  $P_f$ .

### Editing

The following is a list of characters that are permitted in the output format description:

|           |                                                                                                                                                                                                                                                                                                                                                               |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Blank (b) | This represents a character in the input quantity which will appear in the corresponding output position except under zero-suppression.                                                                                                                                                                                                                       |
| 0         | This is placed in the format description in the rightmost position in which zero-suppression is to occur. If it appears in the first fraction position and if the output fraction is zero, the number will appear as an integer (see examples).                                                                                                               |
| \$        | This will appear unconditionally in the corresponding output position.                                                                                                                                                                                                                                                                                        |
| .         | This will appear in the corresponding output position unless zero-suppression is in effect.                                                                                                                                                                                                                                                                   |
| ,         | This will appear in the corresponding output position unless zero-suppression is in effect.                                                                                                                                                                                                                                                                   |
| S         | A "+" or "-" will appear in the corresponding output position if the input quantity is positive or negative, respectively.                                                                                                                                                                                                                                    |
| +         | A "+" will appear in the corresponding output position if the input quantity is positive. If it is negative a blank will appear.                                                                                                                                                                                                                              |
| -         | A "-" will appear in the corresponding output position if the input quantity is negative. If it is positive, a blank will appear.                                                                                                                                                                                                                             |
| (         | A "(" will appear in the corresponding output position if the input quantity is negative.                                                                                                                                                                                                                                                                     |
| )         | A ")" will always appear in the corresponding output position if the input quantity is negative.                                                                                                                                                                                                                                                              |
|           | If zero suppression is in effect and no "\$" has been specified, the sign or left parenthesis will appear in the position immediately preceding the first non-blank. (If a "trailing sign" is specified it will unconditionally appear in the corresponding output position.) If no sign definition has been made, then the output quantity will be unsigned. |
| *         | This represents the termination of an output format description sequence.                                                                                                                                                                                                                                                                                     |



### Examples

|                       |      |                                               |             |
|-----------------------|------|-----------------------------------------------|-------------|
| (a)                   | EDIT | Y, 0, 12, 0, 9                                | (BCD input) |
| Y                     | PZE  | L                                             |             |
|                       | BCI  | 3, S\$bbb, bb0. 0bb*                          |             |
| L                     | BCI  | 2, -32659635                                  |             |
| <u>PRINT POSITION</u> |      | <u>12 13 14 15 16 17 18 19 20 21 22 23 24</u> |             |
|                       |      | - 3 3 2 , 6 5 9 . 6 3 5                       |             |

```
(b) EDIT Y, 0, 40, 1, 0, 13 (Binary input)
Y PZE L
 BCI 2, Sbbb, bb0. 0b*
L OCT 26 71 60 00 55 70 (Equivalent to
 5863. 0007)
```

---

```
PRINT POSITION 40 41 42 43 44 45 46 47
 + 5 , 8 6 3
```

```

(c) EDIT Y, 0, 3, 0, 16 (BCD input)
Y PZE L
 BCI 2, bb0. bb*
L BCI 3, -bbbbbbbbbb4421

PRINT POSITION 3 4 5 6 7 8
4 4 . 2 1

```

```
(d) EDIT Y, 0, 10, 0, 7 (BCD input)
Y PZE L
 BCI 2, 0. bbbS*
L BCI 2, +bbb987

PRINT POSITION 10 11 12 13 14 15

 . 9 8 7 +
```

**Note:** For BCD input, the quantity must be right-justified with respect to E character positions.

### Macro-Instruction Expansions

|        |                                   |                                                                           |
|--------|-----------------------------------|---------------------------------------------------------------------------|
| REPORT | MACRO<br>STL<br>TXI<br>PZE<br>END | K, T<br>REPLOC<br>REPLOC+1, 0, 0<br>K, T                                  |
| SPACER | MACRO<br>PZE<br>END               | N<br>N, 0, 1                                                              |
| LINE   | MACRO<br>PZE<br>END               | L<br>L, 0, 2                                                              |
| FIELD  | MACRO<br>PZE<br>VFD<br>END        | Y, T, E, P, I<br>Y, T, 3<br>8/E, 8/P, 8/I, 12/0                           |
| PARAG  | MACRO<br>PZE<br>PZE<br>END        | Y, T, N<br>N, 0, 4<br>Y, T                                                |
| REPEAT | MACRO<br>PZE<br>PZE<br>END        | N, M<br>N, 0, 5<br>M                                                      |
| ENDFLD | MACRO<br>PZE<br>END               | 0, 0, 6                                                                   |
| PAGDEF | MACRO<br>STL<br>TXI<br>VFD<br>END | P, N, L, M, K<br>REPLOC<br>REPLOC+1, 0, 7<br>5/K, 8/N, 8/P, 6/M, 6/L, 3/0 |
| DATPAG | MACRO<br>STL<br>TXI<br>VFD<br>END | L, P, K<br>REPLOC<br>REPLOC+1, 0, 8<br>8/P, 6/L, 17/0, 5/K                |

|        |                                                                                 |                                                                                                                                                                                                                    |
|--------|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TITLES | MACRO<br>STL<br>TXI<br>VFD<br>END                                               | Y, T, N, K<br>REPLOC<br>REPLOC+1, 0, 9<br>5/K, 13/N, 3/T, 15/Y                                                                                                                                                     |
| BUCKET | MACRO<br>STL<br>TXI<br>PZE<br>END                                               | L1, L2<br>REPLOC<br>REPLOC+1, 0, 10<br>L1, 0, L2                                                                                                                                                                   |
| FILDEF | MACRO<br><br>STL<br>TXI<br>VFD<br>VFD<br>VFD<br>VFD<br>VFD<br>VFD<br>VFD<br>END | T11, T12, T21, T22, T31, T32,<br>T41, T42, T51, T52, T61, T62<br>REPLOC<br>REPLOC+1, 0, 11<br>H18/T11, H18/T12<br>H18/T21, H18/T22<br>H18/T31, H18/T32<br>H18/T41, H18/T42<br>H18/T51, H18/T52<br>H18/T61, H18/T62 |
| ATTACH | MACRO<br>STL<br>TXI<br>PZE<br>END                                               | K, F<br>REPLOC<br>REPLOC+1, 0, 12<br>F, 0, K                                                                                                                                                                       |
| WRAPUP | MACRO<br>STL<br>TXI<br>PZE<br>END                                               | K<br>REPLOC<br>REPLOC+1, 0, 13<br>K                                                                                                                                                                                |
| CLOSEF | MACRO<br>STL<br>TXI<br>PZE<br>END                                               | F<br>REPLOC<br>REPLOC+1, 0, 14<br>F                                                                                                                                                                                |
| EDIT   | MACRO<br>PZE<br>VFD<br>END                                                      | Y, T, P, C, E, B, I<br>Y, T, 15<br>8/E, 8/P, 8/I, 8/B, 4/C                                                                                                                                                         |

#### IV-C      FOUR-TAPE SORT ROUTINE

##### Definition

From the programmer's point of view, this routine consists of three basic steps. First, the programmer specifies the form of the records which he wants included in the sort. Second, he indicates that he is through adding to the file which is to be sorted and therefore sorting may commence. Finally, he calls for the sorted items in sequence.

##### Procedure

Record specification is accomplished by calling sequence:

|           |      |            |                       |
|-----------|------|------------|-----------------------|
| L         | TSX  | SRTRC, 4   |                       |
| L + 1     | PZE  | A1, A2     |                       |
| L + 2     | YYY1 | B1, T1, N1 |                       |
| .         | .    | .          | .                     |
| .         | .    | .          | .                     |
| .         | .    | .          | .                     |
| L + j + 1 | YYYj | Bj, Tj, Nj | (j = 1, 2, . . . , m) |
| .         | .    | .          | .                     |
| .         | .    | .          | .                     |
| .         | .    | .          | .                     |
| L + m + 1 | YYM  | Bm, Tm, Nm |                       |

where

A1 = the number of words required for this sort record.  
Where A1 is zero, the sort program immediately returns without taking any action. (Note: A1 should be consistent with the Nj, below.)

A2 = the number of field parameters which follow.

PZE to indicate this parameter refers to whole words.  
YYYj = PON thru SIX to indicate this parameter refers to characters, the first of which is to be taken from this character position in the word Bj, Tj.

Bj, Tj = the word in core with which this field begins.

Nj = the number of words (or characters) to be moved to the sort record. Nj = 0 will cause a skip to the next parameter.

The fields specified by calling sequences of this form are moved, in the order called, to a sort record which is built up in a sort buffer. Each entry of the calling sequence generates a record which will be sorted as an integral unit by the program. "Character-specified" fields are "packed" into the sort record. However, "word specified" fields will only be moved beginning with the next whole word available in the sort record. Thus, some character positions preceding such fields may be unused (zeros).

The programmer terminates the sort file and initiates intermediate sort phases by giving:

```
L TSX SRTND, 4
L + 1 PZE R
```

where R is the location to which control is returned on completion of the sort.

In the final phase the programmer may call in the sorted file by giving:

```
L TSX SRTFN, 4
L + 1 End-of-file return
L + 2 Sequence error return
L + 3 Normal return
```

which, except for EOF, will return with the address of the first word of successive records in the address portion of the AC and the record size, in words, in the decrement of the AC. Calling a record may result in the loss of that previously called, hence the records which are to be saved should move to a save area when called.

Where the programmer has not given any records to be sorted, an immediate end-of-file return will result.

#### Parameter Setup

In using the sort program it is necessary to specify the following parameters--all of which must appear consecutively, in order, and immediately preceding the sort program to which they apply:

```

SRTTP PZE STAPE1
 PZE STAPE2
 . .
 . .
 . .
 PZE STAPEr
MRGTP PZE MTAPE1
 PZE MTAPE2
 . .
 . .
 . .
 PZE MTAPEs
FINTP PZE FTAPE1
 PZE FTAPE2
 . .
 . .
 . .
 PZE FTAPEt
SRTKY EQU L
SXCOR EQU X
MXCOR EQU Y
FXCOR EQU Z
Sort Program

```

STAPE, MTAPE, and FTAPE are the symbolic locations of the BCD select addresses of the tapes (i. e., PZE A1 or PZE B4).

SRTTP specifies r tape units that will be written as the sort buffers are filled with records specified by the programmer. These buffers are sorted prior to writing, so that even though the programmer is externally concerned only with specifying sort records, sorting actually takes place during the entire process.

MRGTP specifies s tape units in addition to SRTTP's which are to be made available to the sort program for whatever merge passes are necessary. Therefore, they are not required until after the SRTND is given and may be used by the programmer prior to that time. Since each input (or output) operation is completed and checked prior to initiating the next, greater efficiency will be realized if MRGTP and SRTTP specify tape units on separate channels. Where the programmer does not wish to assign merge tapes he may give

MRGTP BCI 1, NONE

which implies to the sort program that one merge pass will suffice to put the file into sequence. In this case, exceeding capacity (one sequence block per SRTTP) will result in an error stop.

FINTP specifies t tape units which are to be made available to the programmer after the sort is completed and he is ready to process the sorted file. The program does not make a final merge pass on the file. At the time the programmer calls on the sorted file the records are not actually merged, but are provided one at a time, in sequence, to the programmer. Specification of FINTP's can result in extra passes if it turns out that the most efficient merge would terminate with part of the file on one of the FINTP's. If FINTP's are not to be specified by the programmer he may specify:

FINTP BCI 1, NONE

Beginning in SRTFN+1, the symbolic addresses of those tapes which do not contain any part of the sorted file (and hence are available to the programmer) are listed. The list terminates in a zero word and will, of course, include FINTP's.

All sort records will be sorted into sequence on the first L words, as specified by SRTKY. Fields to be sorted in any other than normal 7090 sequence (e.g., descending sequence, EAM sequence) must be converted by the programmer before moving them into a sort record. There is no restriction on the size of SRTKY except that it must not be less than the length of the records to be sorted.

SXCOR, MXCOR, and FXCOR specify the amount of core available to each of the three sort phases, including buffers. In case the programmer desires to save any part of core until the phase in which the sorted file is to be read, it should be understood that both the merge and final phases with their buffers occupy upper core, i.e., from 32768 - MXCOR and 32768 - FXCOR to 32767.

Since the various program phases are not in core together, the sort routine includes a TCD card following the first phase which returns control to BGN when loading of this phase (which will normally include the programmer's first phase) is completed.

Some of the more likely sources of error in using the sort program have been found to be:

1. Using SRTTP's or MRGTP's in a later phase before they have been released from an earlier phase.
2. Excessive allocations of MXCOR and FXCOR, which result in reading over areas of core which the programmer wishes to reserve.
3. Failing to preserve as many words in the first parameter following TSX SRTRC, 4 as are called out by the field' parameters following.
4. Returning for additional sort records after the sort EOF has been reached.



### Exception Messages

Error checking includes I/O parity checks plus checks on word and physical record counts. The exception messages will be printed on-line, as follows:

#### Sort Phase:

WRITE ERROR OR TAPE END ON OUTPUT TAPE XX  
CANNOT WRITE LAST RECORD ON OUTPUT TAPE XX  
CANNOT WRITE END-OF-FILE ON OUTPUT TAPE XX  
CANNOT WRITE COMMUNICATION RECORD EOF XX  
CANNOT WRITE COMMUNICATION RECORD. - TPE XX  
OVERFLOW IN INTERNAL SORT.  
INCORRECT CORE ALLOCATIONS.  
CANNOT LOAD MERGE PHASE.

#### Merge Phase:

CANNOT READ MERGE PASS INPUT TAPE XX  
CANNOT FIND EOF ON INPUT TAPE.  
COMMUNICATION RECORD WORD COUNT IN ERROR.  
CANNOT FIND COMMUNICATION RECORD EOF.  
CANNOT READ COMMUNICATION RECORD XX  
NUMBER OF WORDS READ FAILS TO AGREE WITH NO.  
WRITTEN.  
CANNOT READ INITIAL INPUT RECORDS XX  
\*CANNOT WRITE END-OF-FILE ON OUTPUT TAPE XX  
NUMBER OF PHYSICAL RECORDS READ FAILS TO  
AGREE WITH NO. WRITTEN.

\*CANNOT WRITE COMMUNICATION RECORD XX

CANNOT LOAD FINAL PHASE.

WRITE ERROR OR EOT ON OUTPUT TAPE XX

Final Phase:

CANNOT READ FINAL PASS INPUT TAPE XX

NO. OF WORDS READ FAILS TO AGREE WITH NO.  
WRITTEN.

NO. OF PHYSICAL RECORDS READ FAILS TO AGREE  
WITH NO. WRITTEN.

CANNOT FIND EOF ON OUTPUT TAPE.

CANNOT READ COMMUNICATION RECORD XX

COMMUNICATION RECORD WORD COUNT ERROR.

CANNOT FIND COMMUNICATION RECORD EOF.

The errors indicated with an asterisk are under operator control. All other errors will cause the system to stop. The following message will be printed on-line:

RECOVERY POSSIBLE - CHANGE BAD TAPE - HIT START

The recovery routine reruns the merge pass in which the error occurred.

The XX in the above messages refer to tape numbers.

## IV-D TWO-TAPE SORT ROUTINE

### Definition

This sort routine utilizes two tapes and functions to produce a sorted tape file of logical records (of fixed or of variable length) by repeating the following steps:

1. The SORT region is given one record at a time, which it stores in a table in memory.
2. When the table is full, the records are sorted.
3. The sorted records in memory are merged with a sorted tape file and written on a second tape. The tapes are rewound and the process is repeated, the second tape now being considered the sorted tape file.

### Calling Sequence

The sort routine is entered to preset the region, receive a record for setting, or to terminate the sorting process.

#### (a) Sequence to Preset the Region

|     |     |                 |
|-----|-----|-----------------|
| L   | TSX | SORT, 4         |
| L+1 | PZE | TAPE 1,, TAPE 2 |
| L+2 | PZE | C,, D           |
| L+3 | PZE | E,, F           |
| L+4 | PZE | G,, H           |
| L+5 |     | Normal return   |

TAPE1 and TAPE2 are symbolic locations containing the IOEX select addresses of the two tapes to be used by the region. The tapes must be selected and rewound by the programmer.

C is the address of the first word of the definition table required by the Reader (READ).

D is the address of the first word of the definition table required by the Writer (WRIT).

E is the first address of a table of length F which is used by the region to perform memory sorts. F should be as large as possible.

The key for sorting the records begins in word number G of each record and is H words in length.

(b) Sequence to Give a Record to the Region for Sorting

```
L TSX SORT, 4
L+1 MZE L, T, M
L+2 Normal return
```

L, T is the address of the first word of a record in memory.

M is the number of words in the record. M must be given even if the records are of fixed length.

(c) Sequence to Terminate the Sorting Process

```
L TSX SORT, 4
L+1 PZE 0
L+2 Normal return
```

At return, the following conditions exist:

The address of the accumulator contains the symbolic location of the IOEX select address of the tape that has the sorted information.

The decrement of the accumulator contains a count of the number of logical records in the sorted file.

Bits 21 through 35 of the MQ contain the count of the number of logical records lost during the sorting process due to tape error. Bits S through 20 of the MQ contain zero.

Both tapes will be in a rewound condition.

Regions Used by the Sort Routine

The sort routine uses both the Reader (READ) and the Writer (WRIT). The define and undefine of these regions are performed by the sort routine.

### Restriction

The sorted file must fit on either of the tapes TAPE1 or TAPE2.

### Exception Messages

If an error is encountered, the following error message will be printed and the program will halt:

ERROR IN SORT XX

where XX is the error code.

If a program error was encountered in the Reader or Writer, XX will be the code number for the type of error detected (see error codes specified in Subsecs. IV-G and IV-H for the READ and WRIT routines, respectively.)

For errors encountered in the sort routine, the following codes will be used:

| <u>Code</u> | <u>Type of Error</u>                                |
|-------------|-----------------------------------------------------|
| 1           | Error in sorting records in memory                  |
| 8           | Writing failure occurred                            |
| 9           | End of tape has been encountered                    |
| 10          | Error while writing end-of-file or rewinding tapes. |

#### IV-E WICAR CALENDAR ROUTINE

The WICAR calendar routine can compute the number of work days from a base date of January 1, 1945, to any given date, and, alternatively, can convert the number of work days from January 1, 1945, to a calendar date. This routine is based on two premises: that this calendar repeats itself every 28 years, and that every year as well as every month will begin on a predetermined day within the cycle. (Note: Exceptions to the 28-year cycle are the century years that are not leap years—i. e., are not divisible by 400. The year 2000 is a leap year.) Thus, in developing this program, a table of 28 years has been set up which will suffice for any 28 year period in calendar time.

This table of years, called TLNK, will indicate how many work days have elapsed up to a particular year. The TLNK table will also link into a second set of tables that are set up according to the day that this particular year starts on. If it is not a leap year, one of this set of tables, called TMON-TSUN, will indicate how many work days have elapsed up to a particular month. This table will also indicate the holidays that have occurred up to this particular month, as well as list the holidays that fall in the month. It will allow for up to 3 holidays in any one month. In the TMON-TSUN table there will be a link into the TMWD table by the day the month starts on. The TMWD table will indicate the number of work days up to a particular day. If the particular year is a leap year, the second table is called TLMO-TLSU and will contain two links. The first link is used if the month of the leap year falls prior to March. It will return to the TMON-TSUN table at the same location as if it were not a leap year. The second link is used for March and all subsequent months in the leap year. The days will be modified by a value in the TLMO-TLSU table and then return to the TMON-TSUN table at a location one day later than the day the year starts on.

The same tables are used for both the date-to-workday and workday-to-date conversions. This routine will not put out any dates that fall on Saturday or Sunday. If a Saturday or Sunday date comes into the system, it will be

handled as if it were the previous Friday. This program is presently set up to handle the following six holidays: New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving, Christmas. No dates generated by the system will fall on these days.

The following calling sequence will convert the number of work days from the established base to a date expressed as a binary number.

```
CLA X A non-zero value should be set in the accumulator
LDQ Y The binary number in MQ at B35
TSX WICAR, 4
Error return
Normal return
```

The error return will indicate that a zero value for work days has been entered into the system. At the normal return the accumulator will contain the date that has been developed in the form of MM-DD-YY.

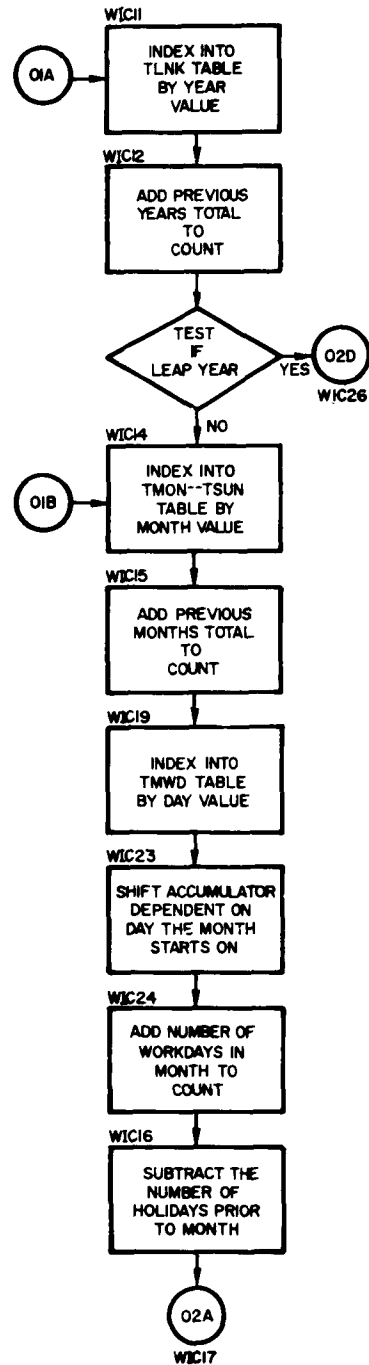
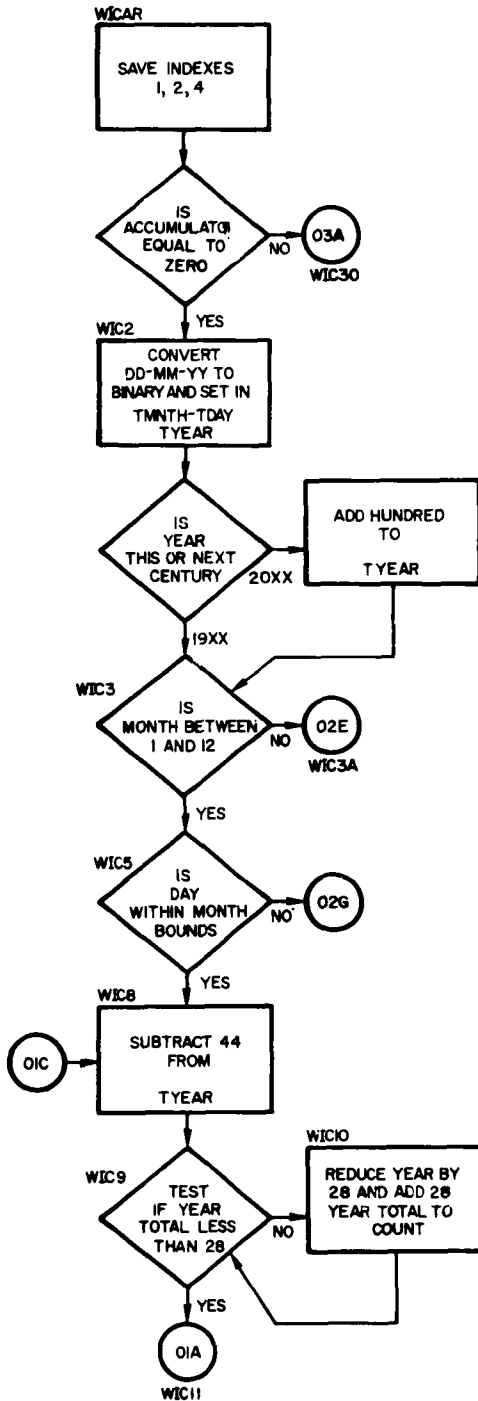
The calling sequence will convert a calendar date to work days in binary from a pre-established base.

```
CLA X A zero value should be set in the accumulator
LDQ Y The date to be converted in the MQ in the form of MM-DD-YY
TSX WICAR, 4
Error return
Normal return
```

The error return will indicate input problems and contain either a 1 or 2 in the address of the accumulator. These values will indicate the following errors: 1 = the month is not between 1 and 12; 2 = the day of the month is not within prescribed limits. The normal return will contain the binary number in the address of the accumulator.

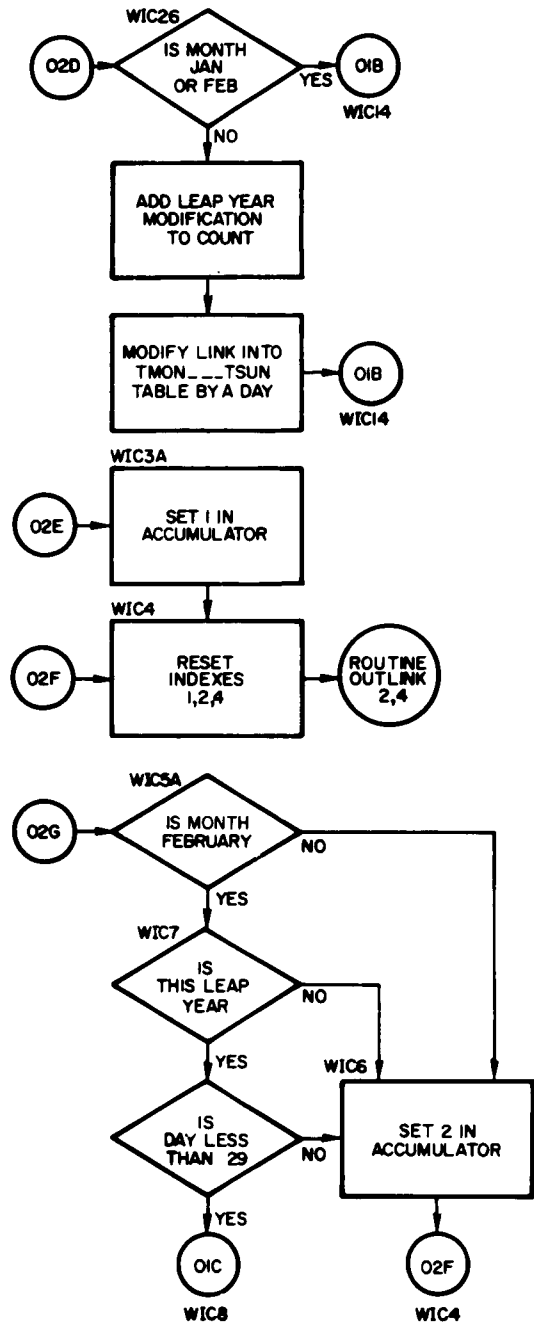
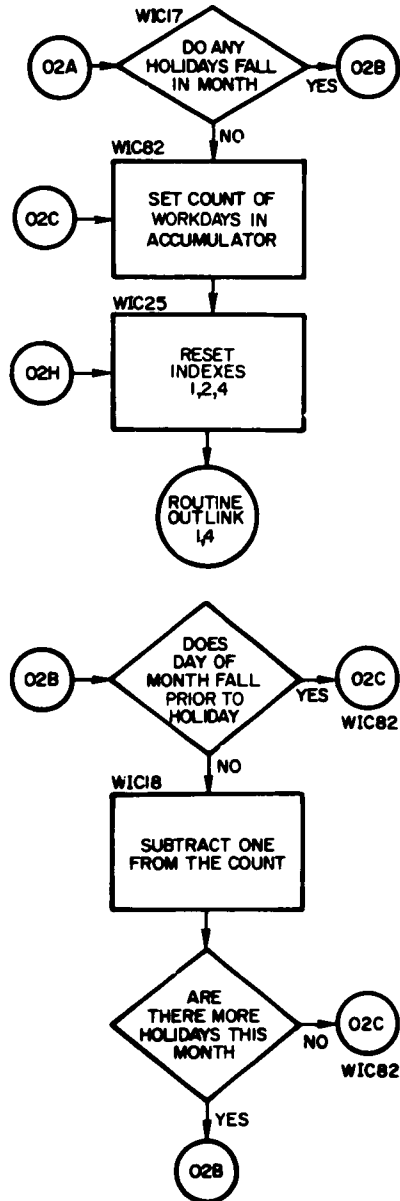
# REGION WICAR

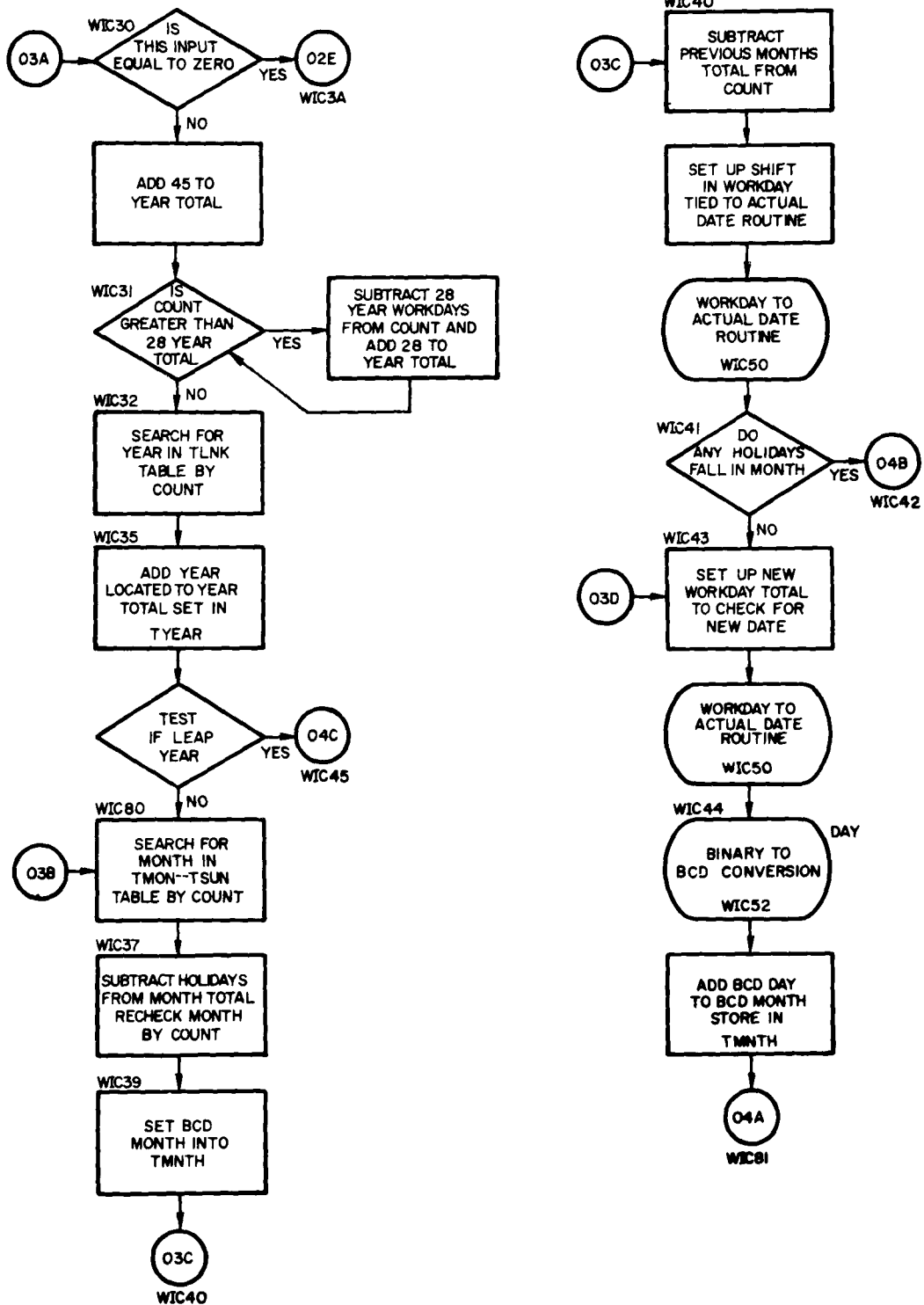
## CALENDAR ROUTINE

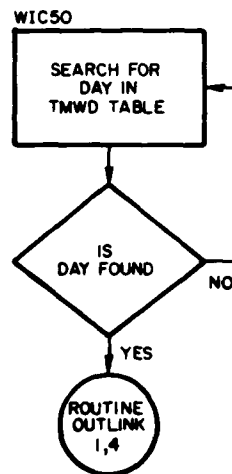
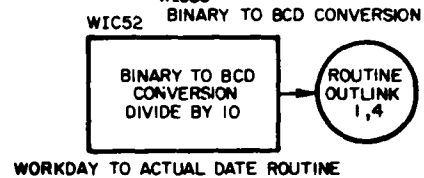
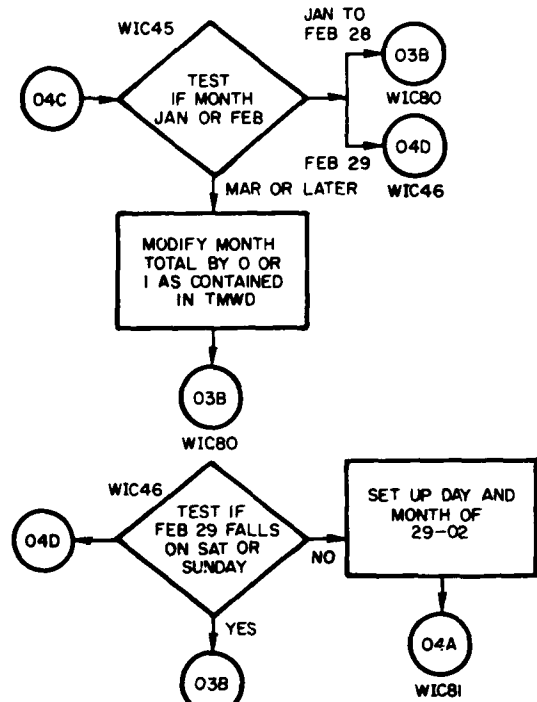
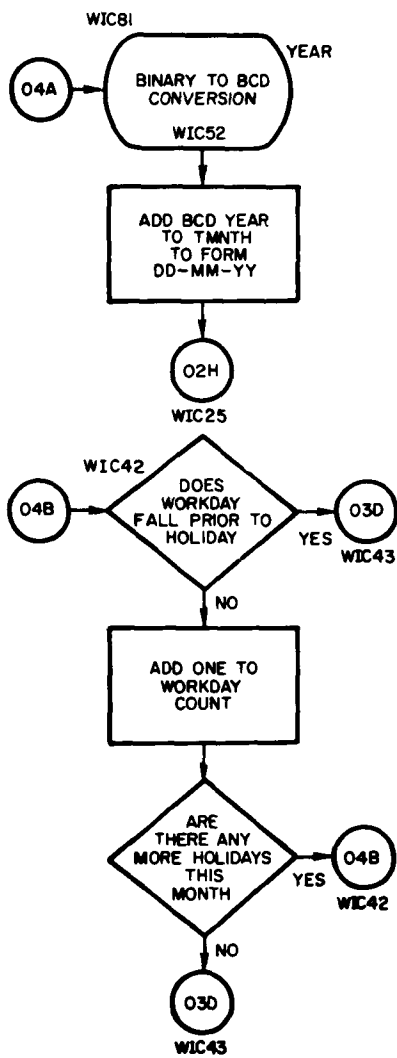




REGION WICAR







#### IV-F            CONVERSION ROUTINES

The regions for converting alphabetic month descriptions to all number descriptions (and vice versa) and for converting BCD data to fixed-point (and vice versa) are described below.

##### Date Conversion Routine (DATE)

#### EXPLANATION OF REGION:

This routine converts a 7-character (alphabetic month) military or standard date to a 6-character all-numeric date, or vice-versa.

#### CALLING SEQUENCE:

L     TSX    DATE, 4  
L+1   PZE    N,, M  
L+2   Normal return

#### INPUT:

Accumulator = first six characters of the date

MQ = seventh character of the date (if necessary) in s, 1, . . . , 5

#### OUTPUT:

Accumulator = first six characters of the date

MQ = seventh character of the date (if necessary) in s, 1, . . . , 5

#### STORAGE USED:

Not applicable.

#### SUBREGIONS AND SUBROUTINES USED:

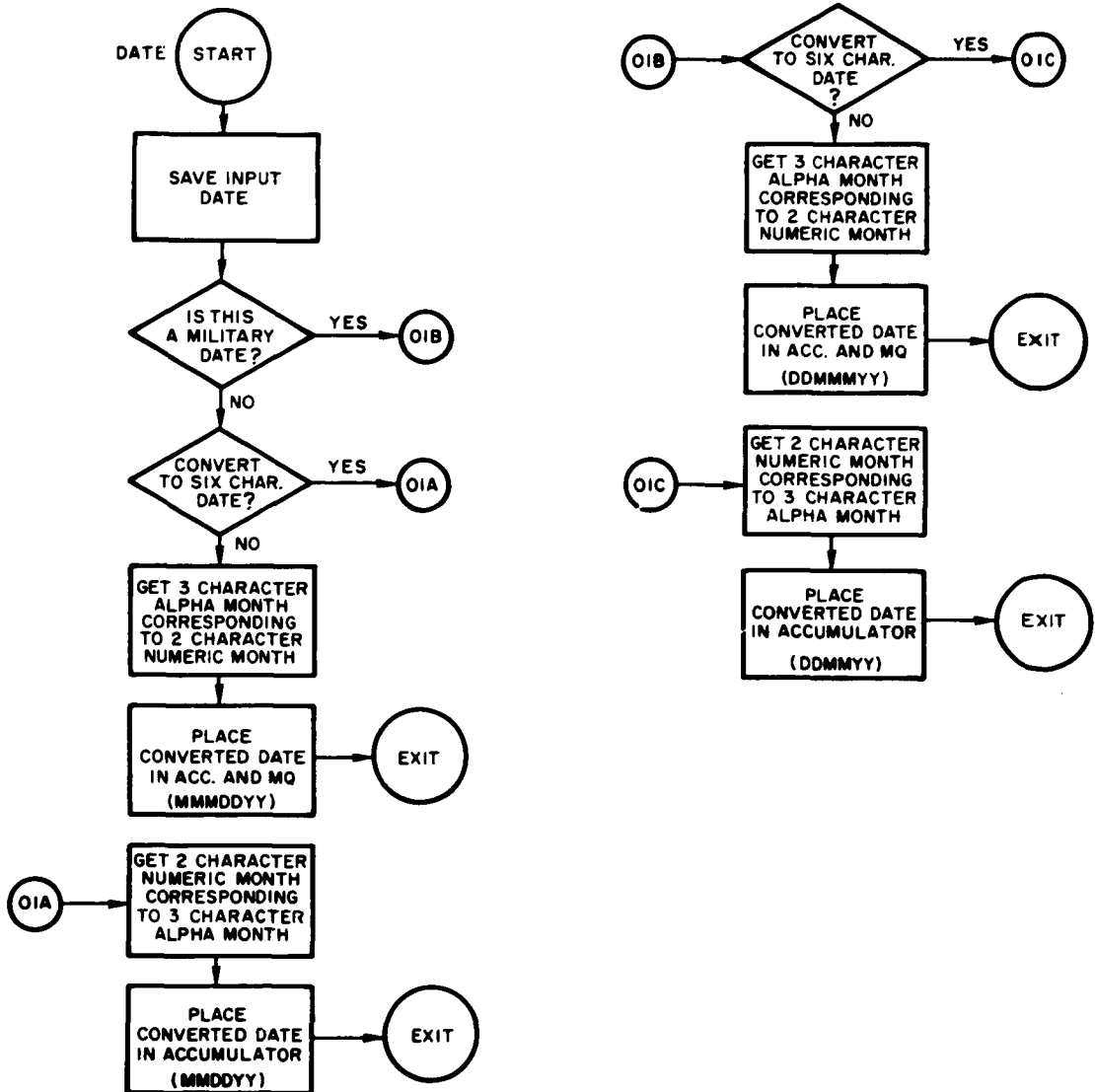
Not applicable.

#### EXPLANATION OF CALLING SEQUENCE:

N = 0    if military date (DDMMYY or DDMMMYY)  
     = 1    if standard date (MMDDYY or MMMDDYY)

M = 0    if converting a 7-character date to a 6-character date  
     = 1    if converting a 6-character date to a 7-character date

# REGION DATE



BCD to Fixed Point Conversion Routine (FIXPT)

EXPLANATION OF REGION

To convert N BCD numbers to a fixed-point integer.

CALLING SEQUENCE:

L-1 LDQ A, T  
L TSX FIXPT, 4  
L+1 PZE N  
L+2 Normal return

INPUT:

A, T = location of the word to be converted.  
N = number of characters to be converted ( $N \leq 6$ ) (characters must be left-justified).

OUTPUT:

Fixed-point integer in Accumulator at B35.

STORAGE USED:

Not applicable.

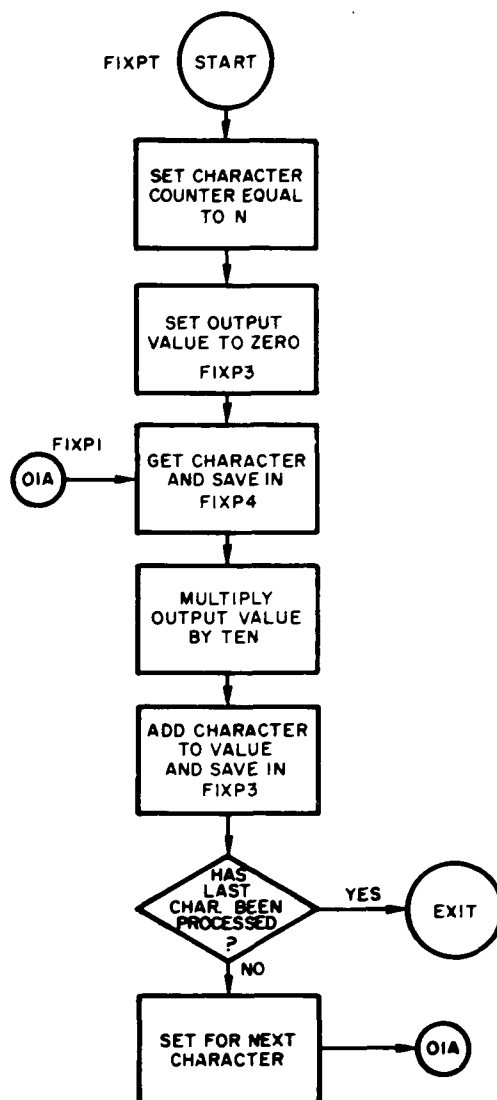
SUBREGIONS AND SUBROUTINES USED:

Not applicable.

EXPLANATION OF CALLING SEQUENCE:

Not Applicable.

REGION FIXPT



Fixed Point to BCD Conversion Routine (FTB)

EXPLANATION OF REGION:

To convert a fixed point integer at B35 to BCD number.

CALLING SEQUENCE:

L TSX FTB, 4

L+1 PZE A, , B

L+2 Normal return

INPUT:

Fixed-point integer at B35 in location A.

OUTPUT:

Twelve BCD characters (right-justified) starting in location B  
(two words).

STORAGE USED:

Not applicable.

SUBREGIONS AND SUBROUTINES USED:

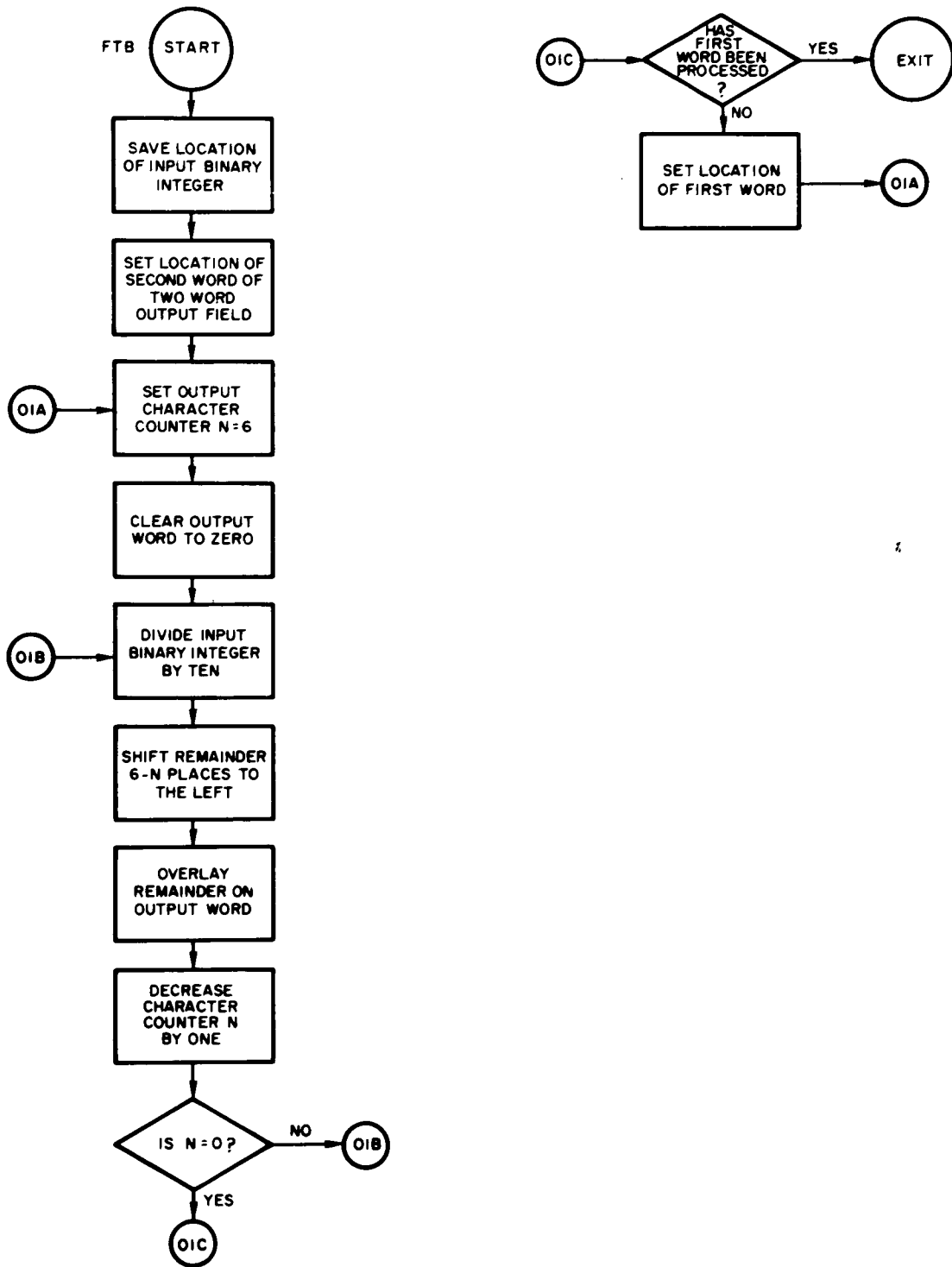
Not applicable.

EXPLANATION OF CALLING SEQUENCE:

A = location of the fixed point integer.

B = location of the first of two words where the BCD number will  
be stored.





#### IV-G THE WRITER

The following is a description of a routine (WRIT) that will write a logical file on one or more tapes.

##### Restrictions

1. Tapes written by the Writer will be in one of the following two formats:
  - a) If logical records are not grouped, each physical record will contain one logical record (of fixed or variable length) followed by its checksum. (The checksum is only examined in case of a redundancy error.)  
  
If logical records are grouped, each physical record contains several fixed-length logical records or one or more variable-length records, as follows:
    - (1) Each fixed-length logical record is followed by its checksum.
    - (2) Each variable-length logical record is preceded by the word length of the logical record as an integer at a B-value of 35 and is followed by its checksum.
2. A tape must be selected, positioned, and its logical file defined before it can be written on by the Writer.
3. A logical file must be undefined after the program has finished with it. If it is not, the Writer may fail to write all the information from the buffers onto the tape.
4. If it is desired to write more than one physical file on the same tape, it is necessary to undefine and define that logical file after each physical file is written.
5. If the Writer is re-entered after having exited due to a program error, the program will halt.
6. The Writer will write only complete physical files.
7. The Writer cannot change tapes until an end-of-tape return has been made for the tape it is finishing.

### Defining A Logical File

The following calling sequence must be used to define a logical file if the Writer is to be used to write the file. The logical file should not be redefined for each tape written. The calling sequence defines only one logical file; however, the programmer may define as many logical files as he desires with as many calling sequences.

```
L TSX WRIT, 4
L+1 PZE TAPE, 1, K
L+2 Program error
L+3 Normal return
```

The writer will begin writing the logical file on the tape whose IOEX select address is contained in symbolic location "TAPE."

"K" is the address of the appropriate definition table in memory. (See Definition Table below).

The Program Error exit is used by the routine if it detects a program error. (See Page IV-G-4).

### Definition Table

```
PZE A, C, B
PZE D, 0, F
```

In the above, the symbols represent the following:

#### A

A represents the address of the first of consecutive locations in memory in which the Writer is to store a physical record to be written on tape. The A-block must be large enough to hold the largest number of words to be written as a physical record.

#### B

If buffering is desired, B is a block of storage equal to A. The A- and B-blocks must not overlap. B is zero if buffering is not desired.

#### C

If logical records are not to be grouped by the Writer, C equals zero. If logical records are to be grouped, C is not equal to zero.

D

D is the maximum length of a physical record to be written by the Writer.

F

If logical records are of variable length, F equals zero. If logical records are of fixed length, F equals record length. The record length does not include the checksum. The Writer computes the checksum.

Writing a Logical Record

Each write entry into the Writer prepares one logical record for writing on a tape. A physical record is written each time the A or B storage block is filled. The calling sequence to write is:

Load accumulator with X (if variable length logical records are being written).

L TSX WRIT, 4

L+1 PZE TAPE, , M

L+2 Program error

L+3 Writing failure

L+4 End-of-tape

L+5 Normal return

In the above, the symbols represent the following:

X

X represents the word length (integer, B=35) of the logical record (not used for fixed length records). The word length does not include the checksum. The Writer computes the checksum.

TAPE

This is the symbolic location containing the IOEX select address of the tape to be written.

M

M is the address of the first of consecutive words to be written on tape as a logical record.

### Program Error

When the Writer transfers to the program error return, the decrement of the MQ contains a code number from 1 to 8 which specifies the type of error detected by the Writer. If a program transfers to the Writer after a return has been made to a program error exit, the program will halt. The codes are as follows:

1. Tried to write on a tape after an end-of-tape return.
2. Error in calling sequence.
3. Tried to write, change tapes, or undefine a logical file when the logical file mentioned had not been previously defined.
4. Error in Writer.
5. Tried to change tapes before an end-of-tape return has been made from the Writer.
6. (not used)
7. Tried to write on a tape which had not been selected.
8. Tried to undefine a logical file after a return to end-of-tape and before a change tape was given for the appropriate logical file.

### Writing Failure

The Writer returns here if a redundancy error occurred when writing a record.

### End-of-Tape

The Writer returns here if it encountered an end-of-tape while writing the last physical record. An end-of-file has been written by the Writer. The program must change tapes before the Writer is given another logical record to write on the logical file concerned.

On all returns, the address of the accumulator contains a count of the number of logical records given to the Writer to write on the logical file. The decrement contains a count of the number of logical records already written on the logical file.

### Tape Changes

The program may only change tapes after an end-of-tape return from a write entry to the Writer. Before the Writer is instructed to change tapes, the

program must initialize the tape selection for the next tape to be written on.

The calling sequence to change tapes is:

```
L TSX WRIT, 4
L+1 PZE TAPE 2, 2, TAPE 1
L+2 Program error
L+3 Normal return
```

TAPE 2 is the symbolic location containing the IOEX select address of the tape to be written.

TAPE 1 is the symbolic location containing the IOEX select address the writer has just finished writing.

PROGRAM ERROR is the program error return described on Page IV-G-4.

#### Undefine

A logical file must be undefined after the program is finished with it and before the tape is selected or repositioned. The calling sequence to undefine is:

```
L TSX WRIT, 4
L+1 PZE TAPE, 3, 0
L+2 Program error
L+3 Normal return
```

TAPE is the symbolic location containing the IOEX select address of the tape.

PROGRAM ERROR is as previously described in Subsec. 4.6.4.

When the writer exits to NORMAL RETURN, an end-of-file has been written on the tape described by TAPE. The address of the accumulator contains a count of the number of logical records written on the logical file.

## IV-H THE READER

The following is a description of a routine (READ) that will read a logical file from one or more tapes.

### Restrictions

1. A tape must be selected, positioned, and its logical file defined before it can be read by the Reader.
2. A logical file must be undefined after the program has finished with it.
3. If it is desired to read more than one physical file in the same logical file on the same tape, it is necessary to undefine and define the logical file after each physical end-of-file before reading the next file.
4. If the reader is re-entered after having exited due to a program error, the program will halt.
5. The reader does not rewind tapes.

### Defining a Logical File

The following calling sequence must be used to define a logical file if the Reader is to be used to read the file. The calling sequence defines only one logical file; however, the programmer may define as many logical files as he desires with as many calling sequences.

|     |     |               |
|-----|-----|---------------|
| L   | TSX | READ, 4       |
| L+1 | PZE | TAPE, 1, K    |
| L+2 |     | Program error |
| L+3 |     | Normal return |

TAPE is the symbolic location containing the IOEX select address of the tape to be read.

K is the address of the appropriate definition table.

### Definition Table

PZE A, C, B

PZE D, E, F

In the above, the symbols represent the following:

#### A

A represents the address of the first of consecutive locations in memory into which the reader is to read a physical record from tape. The A-block must be long enough to hold the largest number of words to be read into memory from one physical record.

#### B

If buffering is desired, B is a block of storage equal to A. The A- and B-blocks must not overlap. B is zero if buffering is not desired.

#### C

If records are not grouped, C equals zero. If records are grouped C is not equal to zero.

#### D

D is the maximum length of any physical record in the logical file if the programmer desires the Reader to read complete physical records into memory. D is the number of beginning words of the physical record which are to be read into memory if only the first part of the record is desired.

#### E

E equals zero, if complete physical records are to be read into memory. E is not equal to zero if only the first D words of a physical record are to be read into memory. If logical records are grouped, then complete physical records must be read.

#### F

F equals zero if logical records are of variable length. F equals the record length, if logical records are of fixed length. The record length is the length of the logical record excluding the checksum.



### Reading a Logical Record

Each read entry into the Reader supplies the program with one logical record.

The calling sequence to read a logical record is:

```
L TSX READ, 4
L+1 PZE TAPE
L+2 Program error
L+3 End-of-file
L+4 Checksum error
L+5 Normal return
```

In the above, the symbols represent the following:

#### TAPE

This is the symbolic location containing the IOEX select address of the tape to be read.

#### PROGRAM ERROR

At this return, the decrement of the MQ contains a code number from 1 to 6 which specifies the type of error detected.

1. Tried to read tape after an EOF return for that tape.
2. Error in calling sequence.
3. Tried to read, change tapes, or undefine a logical file which had not been previously defined.
4. Error in the Reader.
5. (not used)
6. Tried to read a tape which had not been selected.

#### End-of-File

Return is made to this location if an end-of-file has been read by the Reader. The last logical record has been processed in the previous read entry.

#### Checksum Error

If a redundancy occurs and the Reader is to read only the first D words of the physical record into memory, transfer is made to the checksum error exit. If the Reader is to read the entire physical record into memory and a redundancy error occurs, the

checksum of the logical record called for is checked. If the checksum is correct, processing of the record continues and transfer is made to the normal return. If it is not, transfer is made to the checksum error return. The checksum return is the same as the normal return in all respects except the location to which it returns. The logical record is set up for use even though it is in error.

#### Normal Return

The address of the accumulator contains the address of the logical record and the decrement contains a count of the number of words (excluding the checksum) in the logical record.

#### Tape Changes

The program may change tapes when or before an end-of-file is read by the Reader. Before the Reader is instructed to change tapes, the program must select the next tape to be read by the reader. The calling sequence to change tapes is:

```
L TSX READ, 4
L+1 PZE TAPE 2, 2, TAPE 1
L+2 Program error
L+3 Normal return
```

TAPE 2 is the symbolic location containing the IOEX select address of the tape to be read.

TAPE 1 is the symbolic location containing the IOEX select address of the tape just read.

PROGRAM ERROR is the location to which the routine returns if the program tries to change a tape which has not been defined.

#### Undefine

A logical file must be undefined after the program is finished reading it. The calling sequence to undefine is:

```
L TSX READ, 4
L+1 PZE TAPE, 3, 0
L+2 Program error
L+3 Normal return
```

TAPE is the symbolic location containing the IOEX select address of Tape.

Transfer is made of PROGRAM ERROR if the program tried to undefine a tape which had not been defined.

NORMAL RETURN, the address of the MQ contains a count of the number of logical records (without checksum error) read from the logical file.

## IV-I      OUTPUT PHASE READ ROUTINE

### Definition

This routine (YREAD) will read one logical record from the JSORT, XSORT, or Tape Reader (READ) subroutines.

### Calling Sequence

L     TSX    YREAD, 4  
L+1   PZE    T, , K  
L+2   End of file return  
L+3   Normal return

### Explanation of Calling Sequence

#### (a)    Tape Option T

If T equals zero, a logical record will be read from the JSORT sorting routine.

If T equals 1, a logical record will be read from the XSORT sorting routine.

If T equals TX (where TX is the symbolic name of a tape), one logical record will be read from tape TX utilizing the READ subroutine.

#### (b)    Sort Sequence Length K

K is the number of words in the sort key and is expressed as a number from 0 to N.

K is used only when the sort key is to be removed from the logical record for processing. If the sort key contains information necessary for the processing of the logical record, K should be set to zero.

### Output from Routine

- (a)    Location YCNT contains the location of the first word of the logical record (including the sort key) in the address and a count of the number of words in the logical record (including the sort key) in the decrement. On the end-of-file condition, both the address and the decrement contain zero.

- (b) Index Register 1 contains the location of the first word (complemented) of the logical record (excluding the sort key of length K).

Exception Messages

If the JSORT or XSORT sorting routines are used and a sequence error occurs during the reading of the sort tapes, the following message is printed on-line:

A SEQUENCE ERROR WAS FOUND ON THE SORT TAPE  
IN THE REPORTING PHASE

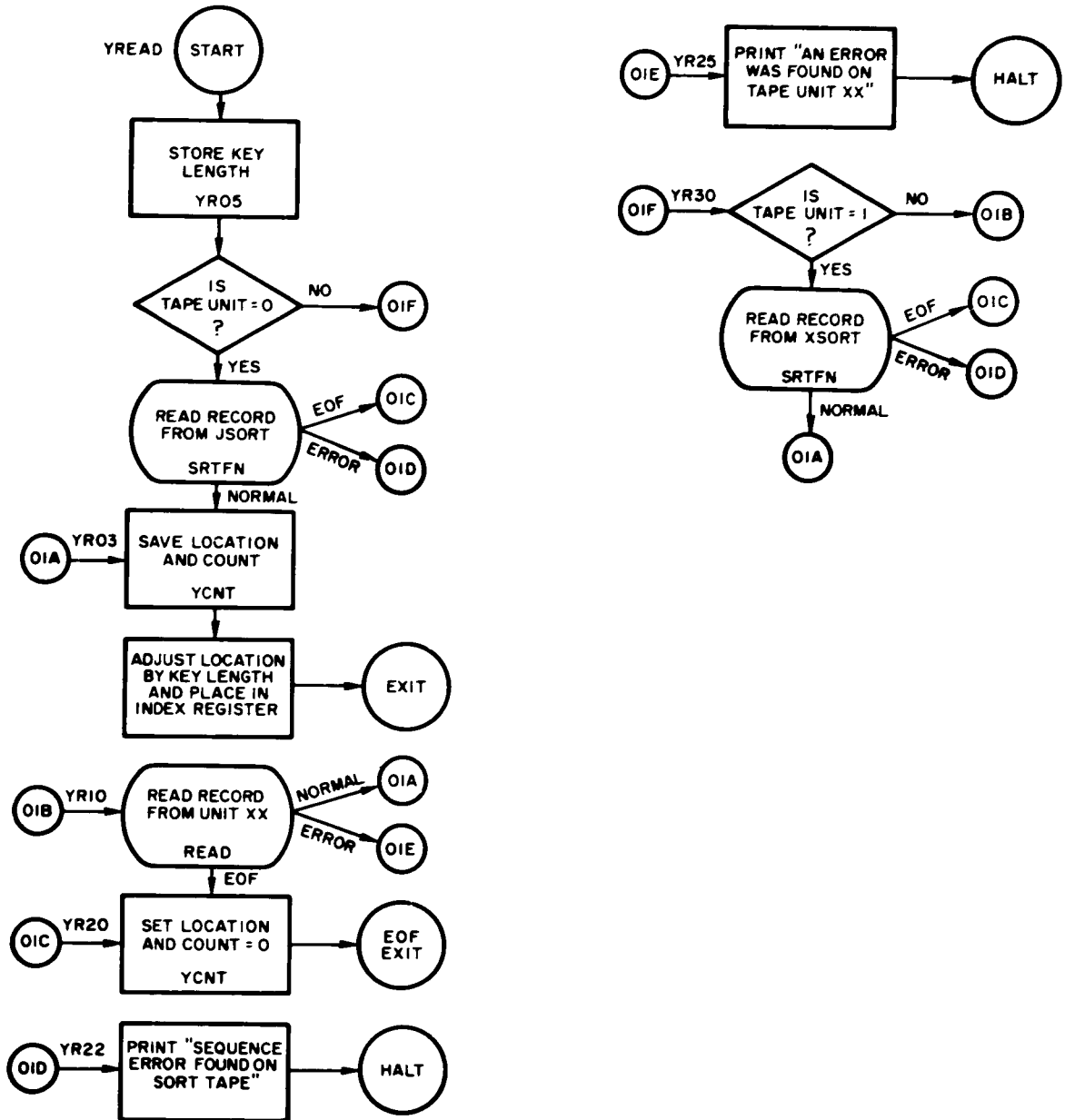
and the computer will halt. The program should be rerun.

If the READ subroutine is used and a redundancy error occurs, the following message is printed on-line:

AN ERROR WAS FOUND IN THE REPORTING PHASE ON  
TAPE UNIT XX

and the computer will halt. The tape on unit XX should be replaced and the program rerun.

# REGION YREAD



#### IV-J OTHER SUBROUTINES

Other subroutines used in processing PERT data are described on the remaining pages of this Subroutines section.

##### Unpacking Routine (UPCK)

##### EXPLANATION OF REGION:

This region takes one or more words in memory (6 characters per word) and stores each character into bits 30-35 of consecutive word in memory.

##### CALLING SEQUENCE:

L TSX UPCK, 4  
L+1 PZE A, T, N  
L+2 PZE B, I  
L+3 Normal return

##### INPUT:

One or more words containing the N characters to be unpacked.

##### OUTPUT:

N characters contained in bits 30 through 35 of N consecutive words. Bits 5 through 29 are zero.

##### STORAGE USED:

Not applicable.

##### SUBREGIONS AND SUBROUTINES USED:

Not applicable.

##### EXPLANATION OF CALLING SEQUENCE:

A, T = Beginning location of the words to be unpacked  
(first character in bits 5, 1, ..., 5).  
B, I = Beginning location of N words each containing one character  
in bits 30-35.  
N = Number of characters to be unpacked.

### Packing Routine (PACK)

#### EXPLANATION OF REGION:

This region takes one or more characters, located in bits 30-35 of consecutive locations in memory, and forms one or more packed words (6 characters per word) in consecutive locations in memory.

#### CALLING SEQUENCE:

L     TSX     PACK, 4  
L+1 PZE     A, T, N  
L+2 PZE     B, I  
L+3 Normal return

#### INPUT:

N characters starting in location B, I.

#### OUTPUT:

One or more packed words (6 characters each) beginning in location A, T. Incomplete words are justified left and filled out with zeros.

#### STORAGE USED:

Not applicable.

#### SUBREGIONS AND SUBROUTINES USED:

Not applicable.

#### EXPLANATION OF CALLING SEQUENCE:

A, T = Beginning location of packed words.  
B, I = Beginning location of unpacked characters.  
N     = Number of characters to be packed.



### Memory Sort (MSRT)

#### EXPLANATION OF REGION:

To internally sort one file of items in the same storage locations originally occupied by the file.

#### CALLING SEQUENCE:

|     |               |         |
|-----|---------------|---------|
| L   | TSX           | MSRT, 4 |
| L+1 | PZE           | A,, C   |
| L+2 | PZE           | L,, N   |
| L+3 | PZE           | K,, M   |
| L+4 | Normal return |         |

#### INPUT:

One file of items stored in consecutive locations in memory.

#### OUTPUT:

One file of sorted items arranged in memory in increasing order.

#### STORAGE USED:

Not applicable

#### SUBREGIONS AND SUBROUTINES USED:

Not applicable

#### EXPLANATION OF CALLING SEQUENCE:

|   |   |                                               |
|---|---|-----------------------------------------------|
| A | = | Location of first word of first item          |
| C | = | Number of words in the key                    |
| L | = | Location of first word of key (L = 1, 2, ...) |
| N | = | Number of words in each item                  |
| K | = | 0, logical sort                               |
|   | = | 1, algebraic sort                             |
| M | = | Number of items to be sorted                  |

Three-Word to Three-Word Comparison Routine (YCOMP)

EXPLANATION OF REGION:

To compare two 3-word fields.

CALLING SEQUENCE:

|     |        |          |
|-----|--------|----------|
| L   | TSX    | YCOMP, 4 |
| L+1 | CAL    | A, T     |
| L+2 | LAS    | B, T     |
| L+3 | Return | A > B    |
| L+4 | Return | A = B    |
| L+5 | Return | A < B    |

INPUT:

Not applicable

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

Compares three words of field A, T to three words of field B, T.

Three-Word to Three-Word Comparison Routine (YCOMP)

EXPLANATION OF REGION:

To compare two 3-word fields.

CALLING SEQUENCE:

|     |        |          |
|-----|--------|----------|
| L   | TSX    | YCOMP, 4 |
| L+1 | CAL    | A, T     |
| L+2 | LAS    | B, T     |
| L+3 | Return | A > B    |
| L+4 | Return | A = B    |
| L+5 | Return | A < B    |

INPUT:

Not applicable

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

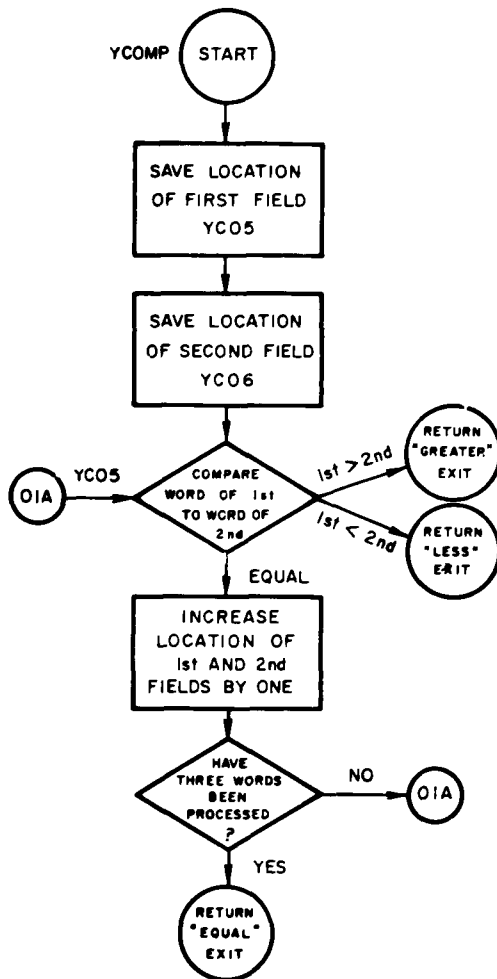
SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

Compares three words of field A, T to three words of field B, T.

REGION YCOMP



Date Comparison Routine (YDCMP)

EXPLANATION OF REGION:

To compare two dates in the form of DDMMYY.

CALLING SEQUENCE:

L     TSX       YDCMP, 4  
L+1   first date greater than second  
L+2   first date equal to second  
L+3   first date less than second

INPUT:

First date in Accumulator.  
Second date in MQ.

OUTPUT:

Not applicable

STORAGE USED:

Not applicable

SUBREGIONS AND SUBROUTINES USED:

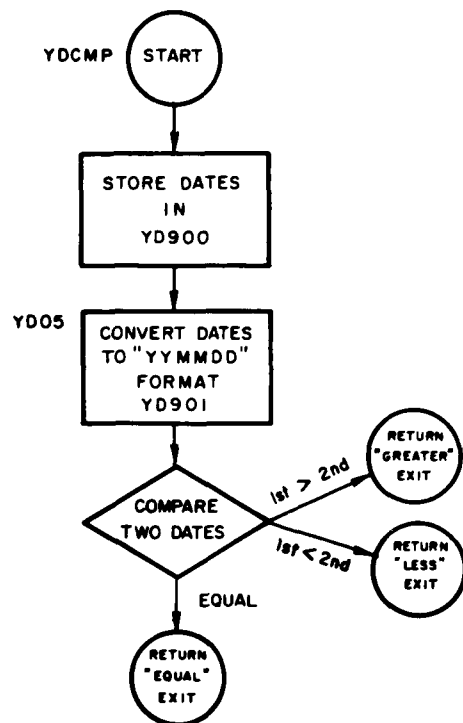
Not applicable

EXPLANATION OF CALLING SEQUENCE:

Not applicable

REGION YDCMP

---



Page Count Routine (YPAGE)

EXPLANATION OF REGION:

To reset or increment page counter.

CALLING SEQUENCE:

L     TSX       YPAGE, 4  
L+1   PZE       S  
L+2   Normal return

INPUT:

Page number in ZPAGE.

OUTPUT:

Adjusted page number in ZPAGE.

STORAGE USED:

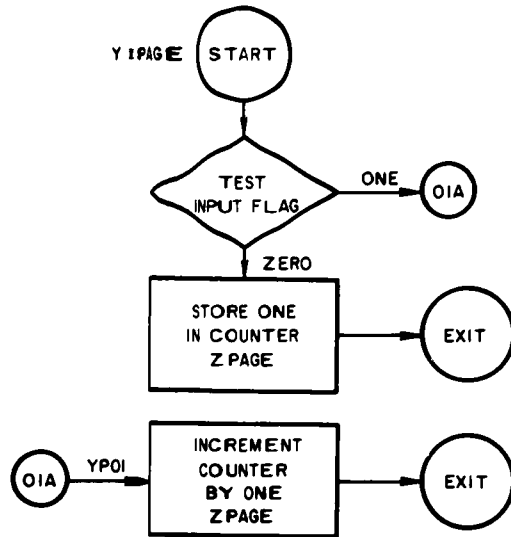
Not applicable

SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

S:     0     = reset page number to 1;  
         1     = increment page number by 1.





Security Number Incrementer Routine (YSEC)

EXPLANATION OF REGION:

To increment the security number by one.

CALLING SEQUENCE:

L    TSX       YSEC, 4

L+1   Normal return

INPUT:

ZSEC    =   previous security number.

ZSECI   =   character of section number to be incremented.

OUTPUT:

ZSEC    =   new security number.

STORAGE USED:

None

SUBREGIONS AND SUBROUTINES USED:

PACK

UPCK

EXPLANATION OF CALLING SEQUENCE:

Not applicable

Security Number Incrementer Routine (YSEC)

EXPLANATION OF REGION:

To increment the security number by one.

CALLING SEQUENCE:

L     TSX     YSEC, 4

L+1   Normal return

INPUT:

ZSEC     =   previous security number.

ZSECI    =   character of section number to be incremented.

OUTPUT:

ZSEC     =   new security number.

STORAGE USED:

None

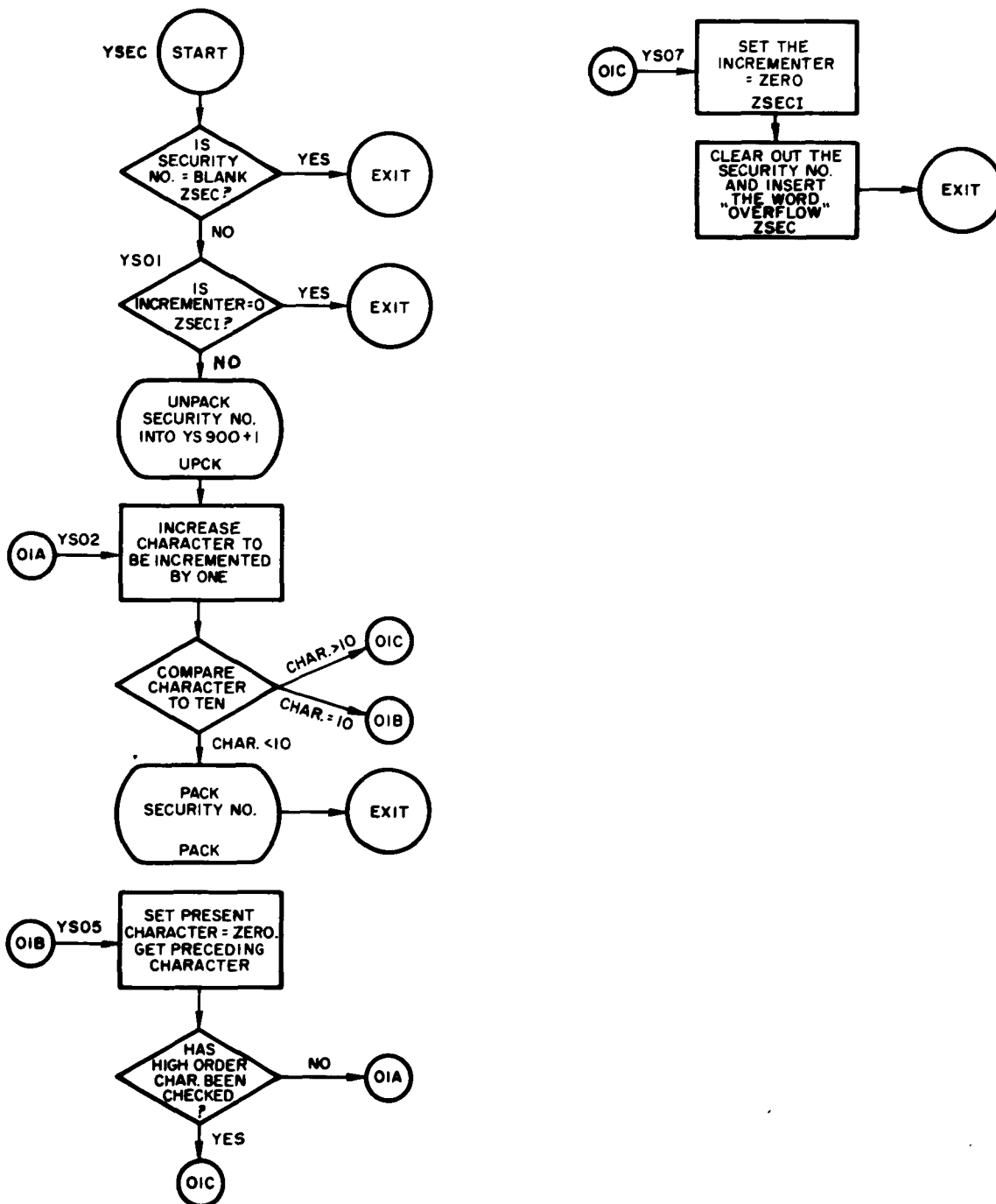
SUBREGIONS AND SUBROUTINES USED:

PACK

UPCK

EXPLANATION OF CALLING SEQUENCE:

Not applicable



Level Checking Routine (YLV L)

EXPLANATION OF REGION:

To check whether a charge number is on or connected to level L.

CALLING SEQUENCE:

L     TSX       YLV L, 4  
L+1   PZE       A, T, B  
L+2   No connection exit  
L+3   Connection to level exit  
L+4   Next lower level exit  
L+5   On level exit

INPUT:

Accumulator = level number "L" in address

OUTPUT:

Christmas Tree Indicator of level "L" in B (3 words).

STORAGE USED:

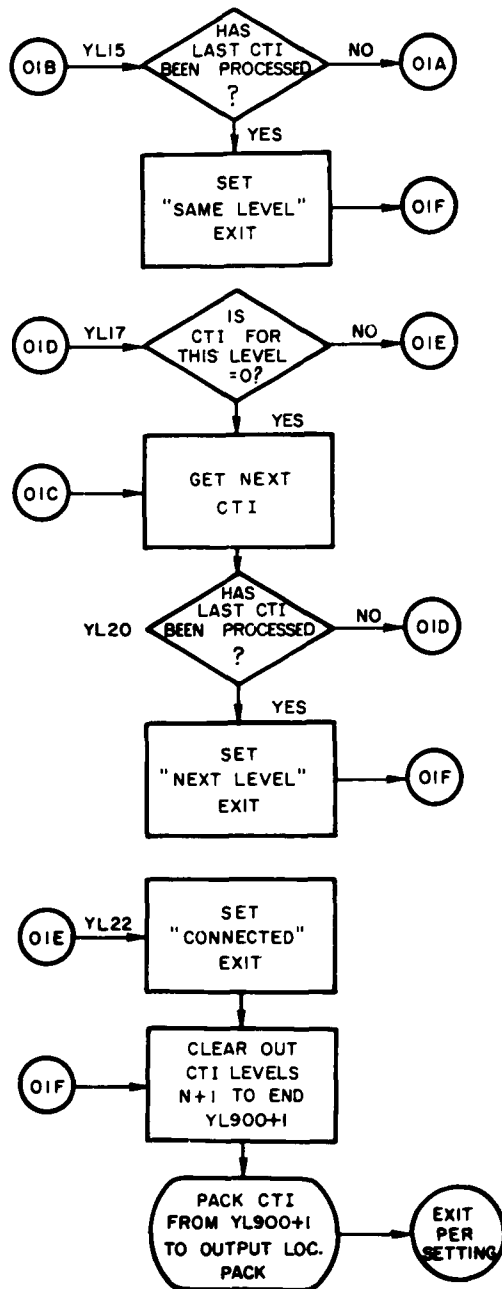
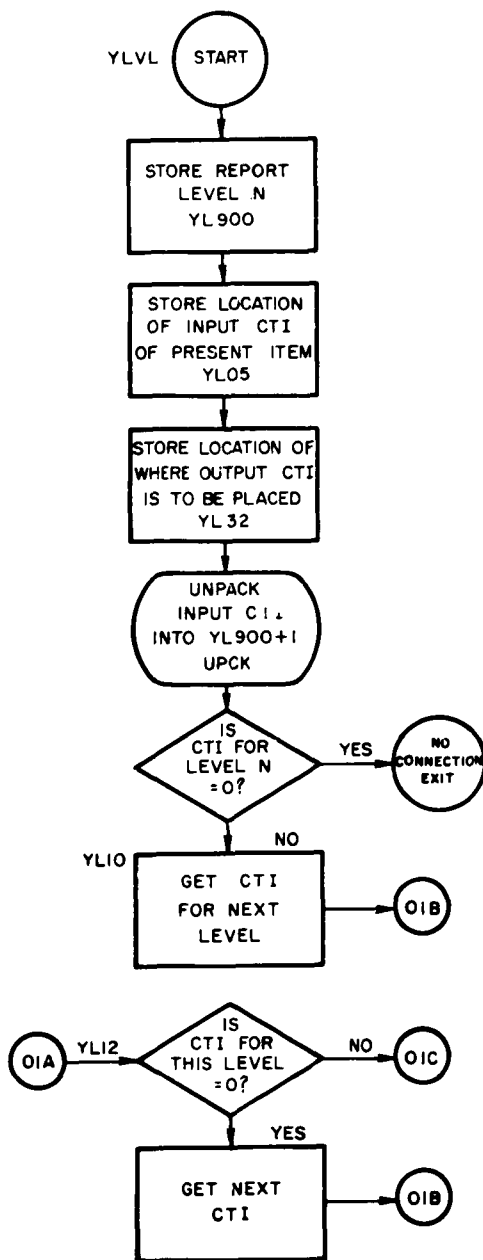
Not applicable

SUBREGIONS AND SUBROUTINES USED:

Not applicable

EXPLANATION OF CALLING SEQUENCE:

A, T     =   Location of CTI for charge number.  
B         =   Location where CTI for level "L" will be stored.



Field Change Routine (YBRAK)

**EXPLANATION OF REGION:**

To check for change in field.

**CALLING SEQUENCE:**

L    TSX       YBRAK, 4

L+1   Change exit

L+2   No change exit

**INPUT**

Accumulator: Location of field in address and tag number of words  
in field in decrementer.

**OUTPUT:**

If a change occurs in the field, the new field will be saved for  
future comparisons, and return will be made through the change exit.

**STORAGE USED:**

Not applicable

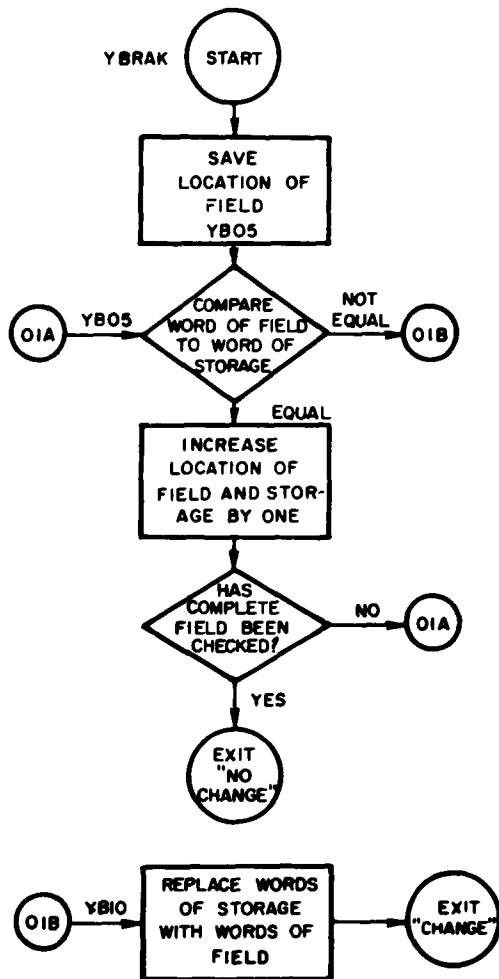
**SUBREGIONS AND SUBROUTINES USED:**

Not applicable

**EXPLANATION OF CALLING SEQUENCE:**

Not applicable

REGION YBRAK



### Output Subroutine (ZKOUT)

#### EXPLANATION OF REGION:

This region processes and writes output messages on the output tape and/or the on-line printer.

#### CALLING SEQUENCE:

Output

PTH A, T,  $1000 \cdot N + PW$  (Note 1)

:

PTH

XXX XXX = PON or FVE

#### INPUT:

1. Location of a BCI image in core (A, T).
2. Number of words in image (N).
3. Right-most print-wheel desired in message (PW).
4. Off-line and/or on-line indicator.
5. Carriage control indicator (CC).

#### OUTPUT:

A message written on the output tape (SYSOU1) and/or the on-line printer.

#### SUBREGIONS AND SUBROUTINES USED:

PACK

UPCK

#### EXPLANATION OF CALLING SEQUENCE:

(a) PTH A, T,  $1000 \cdot N + PW$  (Note 1)

Prints N BCI words ( $1 < N \leq 20$ ) where the first word is located in A, T. The last sixth character of the Nth word is printed by print wheel PW; i. e., PTH L, 0, 20120 will print the contents of L through L + 19 using print wheels 1-120.



- (b) CC = 1, Single space before printing.  
2, Double space before printing.  
3, Restore page before printing.
- (c) FVE Causes the line already set up by previous PTH pseudo-operations to be printed on the on-line printer regardless of Switch 2. (Note 1)
- (d) PON Causes the line already set up by previous PTH pseudo-operations to be output:
- 1) on the on-line printer and on SYSOU1 if Sense Switch 2 is on, or
  - 2) on SYSOU1 alone if Sense Switch 2 is off.
  - 3) on the on-line printer and on SYSOU1 if the decrement of the PON is not zero.

Note 1: HTH may be interchanged with PTH with the same results by writing the input parameters in the following format:

HTH A, T, N, PW

The same definitions apply. HTH L, 0, 20, 120 will print the contents of L through L + 19, using print wheels 1-120.